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The Nation's Food

A Statistical Study
of a Physiological and Social Problem

By

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To

MY FRIEND, "THE CHIEF,"

HERBERT CLARK HOOVER

IN TOKEN OF MY
GREAT ADMIRATION AND
AFFECTION FOR ONE WHOSE
NOBILITY OF CHARACTER
AND BRILLIANCY OF INTELLECT
ARE EQUALLY OUTSTANDING,
THIS BOOK IS DEDICATED

PREFACE

This book grew out of the author's work as Chief of the Statistical Division of the United States Food Administration from June 11, 1917 to March 1, 1919. When plunged into the business of making war it was found in this country, as it had been in every other of the fighting nations, that many data were lacking which were essential to any reasonable prediction as to what the food position was going to be with the passage of time. The work of the Statistical Division of the Food Administration in its early days was chiefly a desperate struggle to get some sort of approximation to an answer for such questions as: "What is our normal consumption of milk?" "How much wheat can we spare for export?" "How much meat must be conserved to meet export demands and still not injure physiologically the home population?"

As time passed and the organization of the food producing and distributing agencies of the country was perfected, we came to possess unique sources of information from which questions like the above could be answered. Still more broadly it was perceived that we had better material than had ever been available before on which to attempt a thorough and searching statistical survey of the food resources and food consumption of the United States. In the summer of 1918 I began the task of putting together the material. It has proved a far greater labor than was anticipated.

No attempt has been made to discuss the related literature. This omission is deliberate. For the United States certainly a statistical analysis of the sort here attempted is pioneer work. In my opinion what is most wanted, is a careful, critical, clear and unbiased presentation of the statistical data, rather than my opinion as to their interpretation. The data comprised in this book have interest and significance, it is believed, for a wide range of specialists, including certainly the student of agricultural problems, of nutritional physiology, of economics, of sociology, and of commerce. The point of view of the writer has been to act as the hod-carrier to these various specialists, delivering to them a mass of carefully made bricks, believed to be solid and true. From these

bricks they can build whatever structures they like, far better than the statistical hodsman could hope to.

At this point I wish to acknowledge my indebtedness to my loyal assistants in the Statistical Division of the Food Administration, Dr. Frank M. Surface, Mr. Stephen Chase, Mr. Mortimer B. Lane, and Mr. John Rice Miner, without whose aid this work could not have been completed for many months, if not years, and without whose advice on many technical points the results would have been far from having that degree of reliability which I think they now possess. The diagrams are the work of Mr. Rudolph von Huhn, whose untiring efforts to make the most significant graphical representations of the data have enhanced the value of the work to the reader.

Finally, I wish to pay tribute to my Chief in the Food Administration, Mr. Herbert Clark Hoover, whose never-failing interest in the project, whole-hearted encouragement of its prosecution, and penetrating criticism of the results at all stages, contributed much to whatever measure of success may have been attained in the investigation. Such keen and just insight into the problems and methods of scientific research as is an integral part of Mr. Hoover's daily thought and life, is as rare among great administrators as it is welcome.

RAYMOND PEARL.

February, 1920.

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THE NATION'S FOOD

CHAPTER I

THE FOOD PROBLEM

The substantial truth of the slogan "Food will win the war" must now be evident to any thinking person. The relatively enormous proportion of the total man power involved in direct or indirect military activities in all of the belligerent nations except the United States, with the heavy involvement of farm man power in this country; the disparity between tonnage supplies and needs which resulted in a far-reaching dislocation of the normal world trade in foodstuffs; the widespread crop reduction below the normal in 1916 and 1917: and other factors served to make the food problem assume a direct military importance in the late conflict, vastly greater than it had ever had before. The western world had come to look upon its food supply as an inexhaustible thing. Free communication, both international and national, had made famine or anything approaching famine a thing unheard of or undreamed of in the part of the world of which we are speaking. Food was to be sure sometimes relatively scarce, but that condition only meant at the worst high prices for a time. All this the war changed. All too many people during the last three years have been brought within a threateningly short distance of the grim specter of famine.

With the ending of actual warfare and the opening of the stage of negotiations on November 11, 1918, the food problem of the world became not less, but even more pressing than it had been during the war. In the first place the moral and spiritual motive on the farmer's part to keep production at a maximum in order to help "win the war" ceased at once to operate. In the second place, as events have shown, the internal political readjustments which are taking place in every country involve a general disorganization which is not conducive to the production of maximum crops. Hunger is a potent stimulus to Bolshevism. But unfortunately Bolshevism is not a good alleviant of hunger. It works in fact quite the other way, except for the very short period in which the uprising

masses steal any goods, edible or other, which the classes may happen to have on hand. In consequence of the destruction of war, on the one hand, and Bolshevism on the other hand, the world food problem is made more difficult by the additional burden of countries normally food exporting, such as Russia, Germany and Austria, and devastated countries like Poland, Northern France, Serbia, etc.

The food conditions in Europe on December 1, 1918, are shown graphically in Fig. 1.

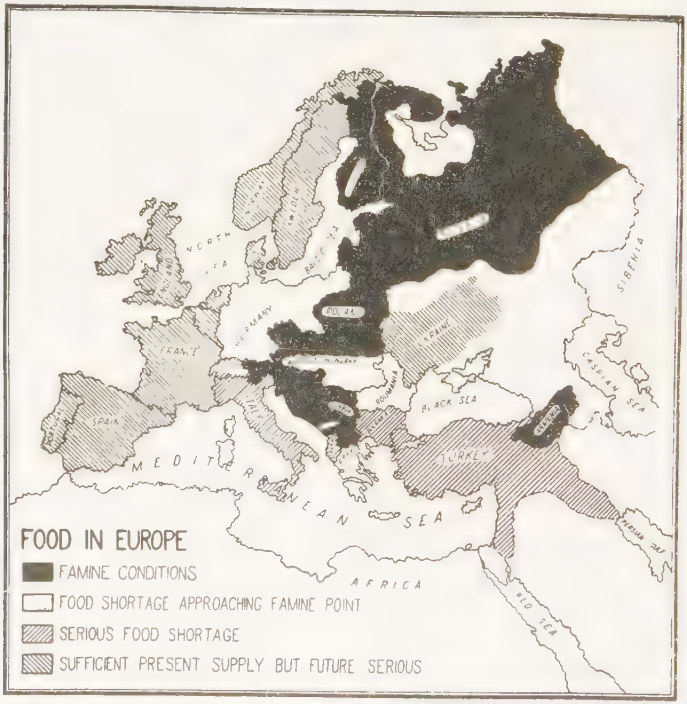

Fig. 1.—Food map of Europe.

This diagram shows clearly what a pressing matter the after-war food problem is.

From the beginning of the war Germany realized the menace of food shortage. Her very position at the outset, with the certainty of an effective blockade sooner or later, made it imperative for her to take stock of her food resources, both actual and potential. Hence in the report of the Eltzbacher Commission we had the first serious attempt at a survey of national food resources. Since that time

all of the other principal belligerent countries have carried through similar studies, with greater or less critical, scientific acumen.

It is the purpose of this present book to give as careful and critical analysis of the food resources of the United States, as it is possible to make with existing information. The need of such a study for the United States at this time is greatly enhanced and indeed made imperative, by reason of the fact that to an ever-increasing degree this country is being called upon to feed Europe. England, France, and Italy bore the brunt of the actual fighting for nearly four years. This splendid stemming of the tidal wave of mingled science and savagery which is Hun warfare, was only accomplished at the expense of every form of productivity other than military. Especially has agricultural production suffered in these three countries because of two factors: first the drawing of agricultural labor into the armies, which could not be prevented, on the one hand because of the fearful necessity for men at the front, and on the other hand because it has not been practically feasible to demonstrate to draft officials the essentially skilled character of agricultural labor. In the second place the enemy occupation of some of the best agricultural land, in the case of France and Italy, has made tremendous inroads on the national production of foodstuffs.

With the existing shortage of ocean tonnage, and the enhanced needs for what does exist, America becomes almost the only practically available source from which may be eked out the diminished food resources of the Allies. The extent to which these countries have relied upon the United States for food since the beginning of the war is not generally recognized. It will be profitable to examine cursorily the facts.

There are here tabulated (Table 1) the total exports to the United Kingdom, France, and Italy of each of the more important food materials from the beginning of the war until our entrance, viz., from July 1, 1914, to April 1, 1917, and for comparison with this the total exports of these same commodities to the same countries for the first year of participation of the United States in the war, April 1, 1917 to April 1, 1918. In subsequent tables these commodities are reduced to nutritive units and the three periods — before the war, since the beginning of the war until our entrance, and our first year as a belligerent, are compared.

The detailed exports for the two periods, since the beginning of the war until our entrance, and our first year in the war, with the

TABLE I.—EXPORTS OF FOODSTUFFS TO THE WESTERN ALLIES (1) FROM THE BEGINNING OF THE WAR TO THE ENTRANCE OF THE UNITED STATES AND (2) DURING OUR FIRST YEAR IN THE WAR

[illegible]	Exports of foodstuffs from beginning of war until April 1, 1917		Exports of foodstuffs for our first year in war, 1917–18	Increase or decrease in yearly exports for our first year in war		Per cent increase or decrease	
	Total for 2¾ years	Yearly average	Total for year	Increase	Decrease	Per cent. increase	Per cent. decrease
[illegible] lbs.	41,037,755	14,922,820	19,627,228	4,704,408		31.5	
Bread and biscuit, lb.	401,534	146,012	2,453,685	2,307,673		1580.5	
[illegible] bbl.	34,851,402	12,673,237	22,974,564	10,301,327	.....	81.3	
Cornmeal, bbl.	266,689	96,978	1,194,072	1,097,094	.....	1131.3	
[illegible]meal, lb.	100,183,476	36,430,355	267,261,210	230,830,855		633.6	
[illegible] bu.	230,754,056	83,910,566	94,059,843	10,149,277	.....	12.1	
[illegible] lb.	8,752,978	3,182,901	156,667,140	153,484,239	.....	4822.1	
Rye, bu.	4,088,771	1,486,826	9,714,113	8,227,287	.....	553.3	
Rye flour, bbl.	25,271	9,189	316,900	307,711	.....	334.9	
Wheat, bu.	338,007,596	122,911,853	54,199,206	.....	68,712,647	.....	55.9
Wheat flour, bbl.	17,279,246	6,283,362	13,459,424	7,176,062	.....	114.2	
Fresh fish, lb.	503,971	183,262	5,200,713	5,017,451	.....	2737.9	
Dried, smoked and cured fish, lb.	3,592,367	1,306,315	11,747,206	10,440,891	.....	799.3	
Pickled fish, bbl.	102	37	258	221	.....	597.3	
Canned salmon, lb.	248,565,675	90,387,518	52,760,998		37,626,520		41.6
Dried apples, lb.	10,529,843	3,829,034	2,641,120	.....	1,187,914	.....	31.0
Dried apricots, lb.	26,207,083	9,529,848	1,700,466	.....	7,829,382	.....	82.2
Dried peaches, lb.	13,778,625	5,010,409	2,178,857	.....	2,831,552	.....	56.5
Dried prunes, lb.	58,257,924	21,184,700	18,573,309	.....	2,611,391	.....	12.3
Canned beef, lb.	154,691,923	56,251,608	71,109,372	14,857,764	.....	26.4	
Fresh beef, lb.	486,453,658	176,892,239	235,368,478	58,476,239	.....	33.1	
Pickled beef, lb.	29,931,456	10,884,166	8,874,744	.....	2,009,422	.....	18.5
[illegible]margarine, lb.	1,832,238	666,268	313,140	.....	353,128	.....	53.0
Tallow, lb.	19,824,112	7,208,768	1,530,406		5,678,362		78.7
Bacon, lb.	959,029,468	348,737,988	490,523,133	141,785,145	.....	40.7	
Hams and shoulders, lb.	621,293,740	225,924,996	276,293,189	50,368,193	.....	22.3	
Lard, lb.	628,922,999	228,699,272	164,216,223	.....	64,483,049	.....	28.2

Neutral lard, lb.	24,192,425	8,797,245	2,905,219		5,892,026		67.0
Fresh pork, lb.	53,420,378	19,425,592	6,002,193		13,423,099		69.1
Pickled pork, lb.	37,382,301	13,593,564	3,176,745		10,416,819		76.6
Lard compounds, lb.	54,736,046	19,904,017	7,438,508		12,465,509		62.6
Lard oil, gal.	590,796	214,835	112,667		102,168		47.6
Butter, lb.	29,615,782	10,769,375	9,506,506		1,262,869		11.7
Cheese, lb.	122,507,802	44,548,292	28,721,385		15,826,907		35.5
Condensed milk, lb.	169,381,907	61,593,421	299,576,626	237,983,205		386.4	
Corn oil, lb.	19,090,602	6,942,037			6,942,037		100.0
Cottonseed oil, lb.	192,145,474	69,870,354	22,769,178		47,101,176		67.4
Corn oil, cake and meal, lb.	24,554,988	8,856,359	1,788,059		7,068,300		79.8
Cottonseed oil, cake and meal, lb.	489,134,381	177,867,047	32,949,766		144,917,281		81.5
Linseed oil, cake and meal, lb.	112,779,510	41,010,731	127,784,159	86,773,428		211.6	
All other oil, cake and meal, lb.	12,808,993	4,657,816	896,812		3,761,004		80.7
Molasses, gal.	3,505,202	1,274,619	2,026,693	752,074		59.0	
Syrup, gal.	18,794,794	6,834,471	9,899,639	3,065,168		44.8	
Refined sugar, lb.	2,371,773,436	862,463,066	479,968,581		382,494,485		44.3
Glucose and grape sugar, lb.	111,016,197	149,160,435	127,271,842		22,188,593		14.8
Beans and dried peas, bu.	415,668	151,152	177,355	26,203		17.3	
Onions, bu.	120,677	43,883	1,547		42,336		96.5
Potatoes, bu.	858	322	2,011	1,689		524.5	
Canned vegetables, value	$2,494,897	$907,235	$2,369,539	$1,462,304		161.2	
Total in pounds (not including canned vegetables).		15,650,099,865	15,031,875,723		618,224,142*		3.95
Total in metric tons		7,098,838	6,818,414		280,424*		3.95

* Net decrease.

period from July 1, 1914 to April 1, 1917 reduced to a yearly average, are shown in Table 1. In right-hand columns are given the increase or decrease in the year's exports of each commodity during our first year as a belligerent. These increases or decreases are shown both in absolute and percentage figures.

It will be noted from the last lines of Table 1, that during our first year in the war, the total exports to the Western Allies were over 600,000,000 pounds, or 280,000 metric tons, *less* than the average for the preceding years of the war. The percentage figures show, however, this was a decrease of only 3.95 per cent. As will be shown in subsequent chapters our available food resources from which to ship abroad were notably low in 1917–18.

The figures for wheat show the one really large decrease which is, of course, due to the small size of the 1917 crop. Wheat exports decreased over 68 million bushels, or 56 per cent. of the average for the first years of the war.[1] It is interesting to note that every other cereal shows an increase, rice leading with an increase of 153 million pounds or 4822 per cent. Wheat flour made a substantial gain of 7 million barrels or 114 per cent. The increases and decreases were made in classes, all the cereals *increased* except wheat, all the fats show quite a marked *decrease*, as do the dried fruits. Canned beef, fresh beef, bacon, and hams and shoulders increased, while pickled beef, fresh pork and pickled pork decreased. Condensed milk increased over 230 million pounds, or 386 per cent. Refined sugar decreased 380 million pounds, or 44 per cent. Linseed oil cake and meal exports, which decreased after the beginning of the war, again show an increase in 1917–18 of about 87 million pounds, or 211 per cent. There were no exports of corn oil from April 1, 1917 to April 1, 1918.

In order to show that, while the total exports of wheat to our Western Allies have decreased, there has been a greater degree of concentration, Table 2 has been prepared, which gives for different periods the total wheat exports to the Western Allies and to all other countries with their percentages of the total exports.

[1] The export figures here used are the official returns of the U. S. Department of Commerce. They do not include shipments to our own Expeditionary Forces abroad, or to certain other destinations. More detailed discussion of this point will be presented in a later chapter. For the present purpose, which is merely to give a general picture of the export situation, these incomplete figures will suffice.

TABLE 2.—EXPORTS OF WHEAT AND WHEAT FLOUR, IN TERMS OF WHEAT (Bushels)

Period	Western Allies*	Other countries	Total all countries	Per cent. total to Western Allies
Yearly average for 3 prewar years	43,322,626	79,390,160	122,716,785	35.3
Yearly average since the beginning of war to April 1, 1917	151,186,982	111,740,770	262,927,754	57.5
Our first year in the war, April 1, 1917 to April 1, 1918	114,766,614	39,366,380	154,132,998	74.5
Month of April, 1918	11,134,633	1,229,309	12,363,942	90.1

*Includes only United Kingdom, France and Italy.

For the last column of Table 2 it may be seen that the percentage of total exports of wheat to the Western Allies has been steadily increasing. During our first year in the war when we exported 154 million bushels the Allies received 114 million bushels or about ¾ of the entire exports. In the month of April, 1918 the United Kingdom, France and Italy received over 90 per cent. of all the wheat exported.

Tables 3, 4 and 5 show the total exports expressed in nutritive units, (1) for the average of the three years preceding the war, (2) for the average of the period from the beginning of the war until our entrance, and (3) for our first year in the war.

TABLE 3.—AVERAGE ANNUAL EXPORTS OF FOODSTUFFS TO THE WESTERN ALLIES FOR THE 3 PREWAR YEARS, 1912–14, IN TERMS OF NUTRITIVE UNITS

Country	Protein, lb.	Fat, lb.	Carbohydrates, lb.	Millions of calories	Per cent. of total calories
United Kingdom	446,943,599	475,390,782	2,366,080,388	7,238,373	85.8
France	42,662,833	47,595,837	208,837,056	668,645	7.9
Italy	25,074,768	50,976,576	141,360,767	524,691	6.3
Totals	514,681,200	573,963,195	2,716,278,211	8,431,709	100.0
Totals in metric tons	233,458	260,348	1,232,096		

TABLE 4.—AVERAGE ANNUAL EXPORTS OF FOODSTUFFS TO THE WESTERN ALLIES, SINCE THE BEGINNING OF WAR TO APRIL 1, 1917, IN TERMS OF NUTRITIVE UNITS

Country	Protein, lb.	Fat, lb.	Carbohydrates, lb.	Millions of calories	Per cent. of total calories
United Kingdom	942,566,353	752,467,975	5,148,194,400	14,504,230	54.6
France	497,847,876	223,367,519	2,995,310,691	7,439,886	28.0
Italy	344,212,654	100,312,101	1,924,652,876	4,643,407	17.4
Totals in pounds	1,784,626,883	1,076,147,625	10,068,157,967	26,587,523	100.0
Totals in metric tons	809,501	488,137	4,566,886		
Per cent. which increase of total is of prewar average exports	246.7	87.5	270.7	215.3	

TABLE 5.—EXPORTS OF FOODSTUFFS TO THE WESTERN ALLIES DURING OUR FIRST YEAR AS A BELLIGERENT, 1917–18, IN TERMS OF NUTRITIVE UNITS

Country	Protein, lb.	Fat, lb.	Carbohydrates, lb.	Millions of calories	Per cent of total calories
United Kingdom	1,164,888,208	779,583,693	6,146,285,238	16,888,623	66.9
France	309,503,381	173,122,991	2,008,217,895	5,041,541	20.0
Italy	232,033,218	95,546,643	1,328,367,362	3,305,552	13.1
Totals in pounds	1,706,424,807	1,048,253,327	9,482,870,495	25,235,716	100.0
Totals in metric tons	774,029	475,484	4,301,402		
Per cent. which increase of total is of prewar average exports	231.5	82.6	249.1	199.2	

In Fig. 2 the facts regarding the exports of essential nutrients since the beginning of the war are shown graphically.

It is apparent that average rate of export of protein and of carbohydrates to the Western Allies from the United States increased after we became an active belligerent, by an amount well over 200 per cent. as compared with our prewar exports to these same countries. In the case of fat the increase is not nearly so great, but still notable enough if considered by itself, amounting to over 80 per cent. more than the prewar rate.

These facts make apparent the necessity for taking such an account of stock of our food resources as this book attempts. Great

as this country is in its agricultural power it is not an inexhaustible reservoir. We have to feed something over a hundred million people at home out of our supply. It is obviously the part of wisdom, in the face of lack of knowledge as to how long the excessive demands on America for food may continue, to attempt to arrive at as accurate a balance sheet as possible of what we may count on in the way of food, and what we need for ourselves in order to keep this population in a sufficiently nourished and hence efficient condition. And it must be always remembered that for the next few years at

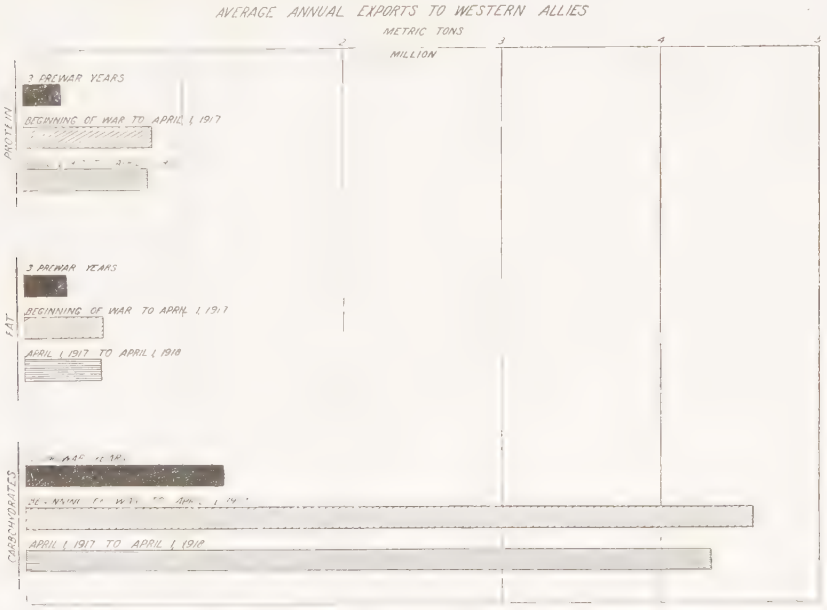

FIG. 2.—Diagram showing exports of essential nutrients to Western Allies, United Kingdom, France and Italy, before and since the beginning of the war.

least now that the war has ended, the demand from Europe on America for food is certain to be extremely heavy, perhaps as heavy as during the period of active fighting. The reconstruction period seems likely to be a long and painful one. Furthermore the neutral countries in Europe, with the cessation of hostilities and the lifting of embargoes, will turn perforce to America for the replenishment of their sadly depleted food resources. Altogether it is apparent that the food problem will be a very real one in the life of this country for several years to come. It is the chief purpose of this volume to contribute in some degree a critical physiological basis for the intelligent discussion of this problem.

CHAPTER II

THE PLAN

The basis of any adequate survey of food resources must be essentially physiological, rather than one of commodities or trade. The value of foods fundamentally depends upon their content of nutrient materials. To get information on how much food a nation produces or needs for consumption, which shall be an adequate guide for the administration of social problems such as those created by war, it is necessary to have something more than raw crop statistics. Modern research in the physiology of nutrition has shown that besides a sufficient gross amount of protein, fat and carbohydrate, it is necessary to have in a diet which is adequately to sustain an individual or a nation a certain amount of accessory substances, certain ones of which are generally called vitamines.[1] These substances are not uniformly or universally distributed among edible materials. Consequently an adequate survey of food resources must take into account not alone the total supplies and consumption of protein, carbohydrate and fat, but also the distribution of these nutrients among the several classes of commodities, the vitamine content of which is known, in general terms at least.

So then, specifically, the problems with which this investigation has to do are such as these:

1. How much protein, fat and carbohydrate is annually produced in the United States in forms used, or usable, as human food?

2. How much of these basic nutrients in forms available for human food are imported and exported each year?

3. What quantities of basic nutrients are annually consumed as human food?

4. What is the distribution of the nutrients produced, imported, exported and consumed, among the several classes of food commodities?

[1] For general résumés of modern work on the physiology of nutrition, see Lusk, G., The Elements of the Science of Nutrition, 3d Edit., Philadelphia, 1917; McCollum, E. V., The Newer Knowledge of Nutrition; the Use of Food for the Preservation of Vitality and Health, N. Y., 1918.

5. What proportion of the total nutrient material produced in the United States is consumed by domestic animals?

These problems are at once physiological and social. The war situation made it urgently necessary to undertake their solution. Properly to attack these problems demanded the working out and application of novel methods, because the problems themselves are new.

The first step obviously is to make a classification of food materials, so that one may effectively apply proper statistical and physiological methods. Broadly speaking the ultimate sources of food are the soil and the sun. The energy derived from the sun through the mechanism of the green plant builds up the inorganic chemical elements of the soil, air, and water, into compounds which can be utilized as food by man, either directly or secondarily in the form of the products of animals which have been nourished on the primary foods of the plant world.

For the purpose of statistical analysis all nutritive materials produced and consumed fall into one or another of the following categories, which are obviously based on the considerations set forth in the preceding paragraph.

I. *Primary Foods*

Including all plant materials used as human food or fractions of such materials, and all animals or animal products in which the animal gets its nourishment from some source other than the primary feeds and fodders as defined below, either

(*a*) Directly as harvested, with only such sophistication as comes from cooking: such as, for example, potatoes, fish, oysters.

(*b*) In derivative form, where by process of manufacture a food product is prepared from a raw plant product: such as, for example, wheat flour or cottonseed oil.

II. *Primary Feeds or Fodders*

Including all plant materials or fractions of such materials used for the nourishment of domestic animals, either

(*a*) Directly as harvested, such as the coarse grains, or

(*b*) In derivative or manufactured form, such as manufactured feeds.

III. *Secondary Foods*

Including all edible products of animals used for human food, the animals being nourished with primary feeds and fodders. This rubric comprises animal foods produced,

(*a*) Directly, without involving the death of the producing animal, such as, for example, honey, eggs, or milk, and

(*b*) Derivatively, involving the death of the animal, such as, for example, the meats.

The basic idea in this classification is, of course, to allocate the nutrient resources of the nation according to the usage made of them. We have certain products of the soil, and of the seas and fresh water lakes and streams, which are directly produced and directly consumed as human food. To produce a crop of potatoes or of cod fish or oysters it is not necessary to feed out to the growing crop some other crop such as hay or grain. Therefore these are direct, primary food products. On the other hand there are many foods such as the meats, eggs, etc., where to obtain a pound of protein, or fat, or carbohydrate for human consumption it is necessary to use a certain amount of other protein, fat, and carbohydrate, primarily produced, as fodder or feed. Human food produced in this manner is obviously secondarily produced and cannot be allowed to count in the net nutritive balance sheet on the same basis as the primarily produced food. It is a relatively more expensive form of nourishment.

It is evident that under this classification many raw food materials will of necessity fall in part into two or more categories. For example, to take the case of wheat, the major part of the raw grain is ground into flour and as such used as human food, but in the process of making the flour there is produced a certain amount of feeding stuffs, bran, middlings, etc., which only indirectly contribute to human nutrition through the products of animals which eat these wheat feeds. Finally a certain small proportion of the wheat grain is fed directly as such to live stock. Similar considerations apply to very many other food materials. That all this adds a considerable complexity to the problem is evident. But it is equally clear that if anything approaching reliability in the final result is to be attained due regard must be paid to these complicated subdivisions in usage of the raw food materials. Otherwise the same nutritive

material will be duplicated in the accounting and a misleading result reached.

The general plan of this study has been first to determine as accurately as possible from existing official statistics, for each year from 1911 to date, the amount of the basic nutrients, protein, fat, and carbohydrate,

(*a*) produced,
(*b*) imported,
(*c*) exported,

classifying the results under the main headings given above. From this tabulation as a base one may then proceed to calculations of consumption and the like.

In making up the basic tables each commodity or derivative of a commodity has been listed separately and converted as such into nutrient values. In the matter of units of measure the following general plan has been followed: in all basic tables the quantities of production, export and import are first given in the American units (bushels, pounds, gallons, etc.) of the original statistics. These quantities are then all converted into metric tons.[1] All nutrient values, protein, fat, and carbohydrate, are given in metric tons. Energy values are expressed in millions of small calories.[2]

Regarding the sources of the basic statistics the following general statement may be made here, to be supplemented by more detailed statements in subsequent chapters where necessary. For *production* figures the fundamental sources, in the case of primary products, are the successive *Year Books* of the U. S. Department of Agriculture. Each volume of this publication carries as an appendix statistical tables giving the Department's official figures of crop production. A secondary source for crop production figures is found in the successive volumes of the *Monthly Crop Report* of the U. S. Department of Agriculture. Its figures are again official and form the basis of the tabulations of the *Year Book*, but frequently give more detailed information. Reliable statistics of the derivative products such as flour, meals, etc., are much more difficult to obtain than crop production figures, for the reason that they are not officially collected and published. In this field resort has been

[1] The metric ton = 2204.6 lb.

[2] A small calory is the amount of heat necessary to raise 1 gram of water 1° Centigrade.

had to a variety of sources, such as trade papers, census returns, special *ad hoc* inquiries of manufacturers, etc. At the appropriate points detailed statements as to how our figures were arrived at will be forthcoming.

Export and import figures are taken from the official reports (annual and monthly) of the foreign commerce of the United States compiled by the Department of Commerce. In a few cases where it has been clear from information available to the Food Administration that the official figures of the Department of Commerce were in error we have not hesitated to use other and, as we believe, more correct statistics, but in each such case specific notation of the fact is made.

In the computation of nutrient values use has been made chiefly of the factors given by Atwater and Bryant.[1] It has been necessary, in some cases, to supplement their tables from data given by Leach[2] and Henry and Morrison.[3]

All calculations in this work have been repeatedly checked and every possible precaution taken to guard against error. It is too much to hope that so extensive a piece of statistical work should be without errors, but I hope that their number is small and their net significance in the final results negligible.

[1] Atwater, W. O. and Bryant, A. P., The Chemical Composition of American Food Materials (corrected April 14, 1906) U. S. Dept. Agr. Office of Expt. Stat. Bulletin 28 (revised edition) 1906.

[2] Leach, A. E., Food Inspection and Analysis, Third Edition Revised and Enlarged by A. L. Winton, New York, 1913.

[3] Henry, W. A. and Morrison, F. B., Feeds and Feeding, Sixteenth Edition, Madison, 1916.

CHAPTER III

THE PRIMARY FOOD PRODUCTION OF THE UNITED STATES

(Commodity References Nos. 1–35)

We come now to the direct statistical analysis of food resources under the first rubric, the primary food materials. At the outset it should be understood that the tables in this and subsequent chapters do not include every single commodity used as food. Many minor and insignificant items are omitted, from necessity. There simply are no statistics available for such things as mushrooms, wild berries, game, and a large number of other subsidiary food items. The omissions, however, are really not a matter of concern. The total contribution of these omitted subsidiary items to the total nutritional intake of the population is statistically insignificant. It undoubtedly does not amount in the aggregate to as much as the probable error of the statistics of the staple foods. The endeavor has been made to include in the tables every item of food which fulfilled the following two requirements: (*a*) a significant contribution to the national nutrition, and (*b*) available statistics either for an exact determination or a reasonable estimate.

Table 7 gives for each year from 1911 on the *production* of all the primary food materials produced in the United States for which any sort of statistics could be obtained. It is necessary for an understanding of the tables that a precise explanation be given of each item.

Before passing to this detailed discussion certain matters of general explanation should be presented.

1. All years, unless otherwise specified in particular cases, are fiscal years beginning on July 1 of the first year named and ending June 30 of the second named year. This fiscal year is chosen for two reasons, viz.:

(*a*) It is the period for which all import and export statistics are normally compiled by the U. S. Department of Commerce.

(*b*) It includes within its limits practically the complete harvesting period of all crops grown in continental United States.

2. In the columns giving nutrients, the terms protein, fat, and carbohydrate are used in the following senses, which are in accord with general usage in works on nutrition:

(*a*) *Protein.*—An arbitrary term used to designate a group of chemical compounds assumed to include all the nitrogenous matter of the food except the nitrogenous fats. It is quantitatively estimated by multiplying the total nitrogen found by analysis by the factor 6.25.

(*b*) *Fat.*—Under this term is included the total ether extract. The ether extract includes, besides the true fats, fatty acids, nitrogenous fats (lecithins), and other related compounds.

(*c*) *Carbohydrates.*—The carbohydrates include sugars, starches, cellulose, gums, woody fibers, etc. Carbohydrates are usually determined by difference in the analysis of foods.

3. In no case is any account taken of "carry-over" in the production figures at this point. There is no necessity for including figures on "carry-over" when, as in the present study, a period of several years in time is included in the statistical analysis. Under such circumstances the inclusion of carry-over or invisible stock estimates would simply complicate and confuse the result. The correct theory of the matter appears to be that in any investigation of food resources and consumption over a period of years, residual stocks should be regarded as having passed into consumption or export or both. This they always do sooner or later. Full physical proof of this fact was found in the United States in the summer of 1918 when the country had no appreciable residual stocks of certain important commodities at the end of the crop year. A further discussion of "carry-over" in the case of certain crops will be given in a later chapter.

4. Unless otherwise specified in particular cases, use has been made throughout of the following general plan of determining nutrient values. First there are made necessary general deductions from the total crop to cover the loss for food usage resulting from any or all of the following general causes:

(*a*) Seed for next crop.

(*b*) Loss from failure to harvest, and incomplete harvesting, frost damage, and other factors lowering, *in the field*, the total net production.

(*c*) Nutritional loss from plant diseases or weather injury which do not affect the total quantity harvested but do affect the

food usage of the product. A good example here is anthracnose in beans, which diverts to lower grade food or fodder uses significant portions of the harvested crop.

(*d*) Loss from vermin (rats, mice, etc.) and other causes in storage and transportation, including decay and spoilage of perishables.

(*e*) Manufacturing losses.

(*f*) Diversion to industrial, non-food uses, including the making of alcoholic beverages.

Having made the best estimates possible of such general deductions Atwater and Bryant's nutritive factors are applied to the residue remaining. Now these authors give, for all foods in which there are losses or wastage in cooking or preparation for the table, two sets of nutritive factors; one for the food "as purchased," the other for the "edible portion." In both cases the analyses are complete (*i.e.*, the percentages add to 100), the percentage of "refuse" being put into the "as purchased" as a part of the analysis. In consequence one gets the same net amount of protein, say, in the apple crop if he applies the Atwater-Bryant "as purchased" percentage 0.3 to the weight of the whole crop, as he will get if he first deducts 25 per cent. from the weight of the crop, which is their figure for inedible refuse, and then to the balance left applies their "edible portion" protein factor of 0.4. Since the net result is the same as we have in all but one case, namely fish, used the "as purchased" factor on the whole crop remaining after the general deductions above explained. In all cases the amounts of protein, fat, and carbohydrate given in the tables in this book are *net* amounts remaining after (*a*) general deduction for seed, crop spoilage and losses, etc., and (*b*) after allowance for refuse in preparing food as purchased for eating.

We may now proceed to a detailed discussion of the sources, significance and corrections of the several items in Table 7.

GRAINS AND THEIR DERIVATIVE PRODUCTS

1. Corn Meal (Maize Meal) and Corn Flour.—There are no official annual statistics as to the production of corn meal in this country. The only available data are the returns of the Census of Manufactures[1] made at quinquennial intervals. To arrive at

[1] The exact bibliographical reference to the last volume of the summary of this work is "Abstract of the Census of Manufactures, 1914," Washington, 1917. Detailed chapters regarding special commodities are separately issued.

annual estimates the following procedure was adopted. To the census returns as to production of corn meal and corn flour in merchant mills for the four years 1899, 1904, 1909, 1914, a parabola was fitted by the method of least squares. From the fitted line annual figures were read off for the years up to 1917–18. In this last year there has been such a marked and abnormal increase in the corn milling capacity of the country that another procedure was adopted to reach an estimate. For the first six months of the year (July, 1917 to December, 1917, inclusive) the value was estimated from the parabola. For the last six months (January to June, 1918, inclusive) the total rated capacity of existing and operating merchant corn mills was taken, on the assumption that under the present stress of need the mills were operating to full capacity.

The procedure so far gave the production of corn meal in merchant mills only. More than in the case of any other grain, corn is custom ground. The farmer takes his grain to the mill and pays the miller to turn it into meal. The amount of such custom milling of corn is too great to neglect. It has, however, been steadily decreasing, at least since 1899. In that year 30.5 per cent. of the total output of corn meal in the country was ground in custom mills. In 1909 this percentage had dropped to 20.7. We have assumed that it has continued to decrease at the same rate since that time, and have accordingly applied a sliding scale increase to the merchant mill output relative to the custom mill to get the total.

2. Hominy and Grits as Corn.—Again there are no official annual statistics of production, so that recourse was had to the quinquennial returns of the Census of Manufactures. To the figures of output of hominy in merchant mills (in terms of bushels of corn used in the manufacture of this product) for the years 1904 ,1909, 1914 a straight line was fitted by the method of least squares, and the values read off for individual years, and by extrapolation after 1914. There appeared to be no sufficient ground for differential treatment of the year 1917–18 in respect of this commodity. Also no correction has been made for manufacture of this product in custom mills. In 1909 only approximately 1 per cent. of the total was so made, and the proportion was decreasing rapidly.

3. Wheat (Nutrients in Flour). The basis for the computation here was the official statistics as to the wheat crop in successive years as given by the Department of Agriculture. For the years 1911–12 to 1915–16 the crop figures were taken from the U. S.

Department of Agriculture Yearbook[1] for 1916, p. 571. For the year 1916–17 the crop figure was taken from the Monthly Crop Report[2] (U. S. Department of Agriculture) for December, 1917, p. 117. For the year 1917–18 the Food Administration estimate of the wheat crop, based on its marketing statistics was used.

Starting with the total crop figures the following deductions were made in order to arrive at the net amount available for human consumption: (*a*) the amount used for seed, determined on the basis of acreage and the average amount per acre used for seeding purposes in the different states; (*b*) 5 per cent. of the crop to cover wastage in storage and transit, loss by vermin, etc.; (*c*) 2 per cent. of the crop to allow for the amount fed to live stock direct. This last item, of course, is included later in the computations of fodder and feed, but in the present chapter we are dealing strictly with human food. The proportion of 2 per cent. of the crop so used is the Department of Agriculture's average estimate on the point. (*d*) The amount used in the manufacture of alcoholic beverages. This is an extremely small item, amounting to an annual per capita consumption of less than 0.006 lb., all of which was stopped during our participation in the war owing to the closing of distilleries.

No deduction is made for industrial non-food or non-fodder uses of wheat for the reason that the amount of such use is so insignificantly small that anything approaching an accurate estimate is utterly impossible. The 5 per cent. general deduction for loss may probably be safely regarded as also including any non-food uses other than those already allowed for.

Having made the above mentioned deductions it is assumed that the balance remaining is ground into flour and feeds. In Table 7 the nutrients of the flour fraction of the balance are set down.

Considerable thought and study has been given as to whether a different set of factors for the calculation of the nutrients in the flour should not be used for the year 1917–18 in view of the milling regulations which required, during the major portion of that year, a higher milling extraction of the wheat as flour than had prevailed before. It has finally been decided to use the same analytical factors for this as other years, because investigation showed that the new flour was so nearly identical in chemical composition with the old as not to make it worth while to take a different basis of

[1] Hereafter this publication will be referred to by the initials D.A.Y.B.

[2] Hereafter this publication will be referred to by the initials M.C.R.

computation so far as concerns analysis. We have, of course, made allowance for the higher quantitative extraction of the berry to flour in 1917–18.

It might at first thought be supposed that separate account should be taken of wheat used in breakfast foods. Consideration will, however, make it apparent that this is not necessary in the method here followed, because we have included *as flour* all the wheat which goes into these products, in our method of calculation. The only possible criticism which could be made on this point would be that the nutritive value of these breakfast foods is different from flour. The difference, however, is so small, and the total amount of wheat which goes into these products is so small as compared with what is consumed as flour that no statistically significant error is introduced by the method here used.

4. Oatmeal.—This item includes rolled oats and all other products of oats used as human food as well as oatmeal in the strict sense. There being no official statistics on the production of these commodities the data were collected *ad hoc* by the Statistical Division of the Food Administration from the Oat Millers' Association. Oatmeal being a derivative product used practically only as human food the whole output has been converted into nutrient values.

5. Barley Meal.—This rubric includes all products of barley used as human food. The production of barley flour, which is a new product in the United States manufactured in commercial quantities for general consumption (other than as baby food) only during very recent years, has become in that year a very significant item. The returns for the production of barley flour we have from the Milling Division of the Food Adminstration for a portion of the year 1917–18 and have made an estimate for the whole year's production from the known data. There being no official annual figures on the production of milled barley products resort has been had again to the quinquennial returns of the Census of Manufactures and a straight line fitted by least squares to the production figures there given for the years 1909 and 1914, and the estimated production of individual years read off the line, except in the case of 1917–18 as above explained. The barley products here dealt with being derivative products, used for human food only, the total production has been converted to nutrient values.

6. Rye Flour.—The same procedure and sources to arrive at annual estimates of production were adopted here as in the case of barley meal.

7. Buckwheat Flour.—The same procedure and sources were used for this commodity as for rye flour and barley meal and flour, except that in the case of buckwheat flour there appeared to be no good reason for any differential treatment of the year 1917–18.

8. Rice.—The crop figures, in terms of cleaned rice, were taken for the year 1911–12 and 1912–13 from D.A.Y.B., 1914, p. 590; for the years 1913–14 to 1915–16 inclusive from D.A.Y.B., 1916, p. 607; and for 1916–17 and 1917–18 from M.C.R., December, 1917, p. 117. From the total crop was deducted (*a*) 5 per cent. of the crop for wastage and spoilage, (*b*) the amount used as seed, and (*c*) the amount used in the manufacture of alcoholic beverages. The residue after these deductions was converted to nutrient values.

VEGETABLES

9. Beans.—Official estimates of the bean crop have been published by the Department of Agriculture only since 1914–15. In the years before that no data whatever were available. The figure for 1915–16 (M.C.R., Sept., 1916, p. 89) was for the 5 principal bean growing states only, New York, Michigan, Colorado, New Mexico, California. In later years returns from an additional state, Arizona, have been included. The figures given include, however, practically the whole of the commerical crop. The 1915–16 figure is from M.C.R., December, 1917, p. 127, and those for 1916–17 and 1917–18, *ibid.*, p. 117. For the years prior to 1914 we have estimated annual production figures to a rough approximation, on the general assumption that there has been no very violent change in bean husbandry as to acreage planted, methods of cultivation, or yield during the last 10 years, and that therefore the crops during the past 4 years make possible an approximate estimate for the three preceding years.

In all cases there has been made a deduction of one-fourth of the total crop before converting to nutrients, to allow for (*a*) seed and (*b*) wastage and spoilage in handling and storage, including effects of disease on nutritive values and usage, etc.

10. Peas (Other Than Canned).—The pea crop in the United States harvested as dry grain, as distinct from that harvested green for canning, is not large. Unfortunately the Department

of Agriculture until very recently has never collected statistics as to its amount. Consequently in order to get at any approximation to the amount of this commodity available for human food we are forced to make the best estimate possible from the published data for two years only. In M.C.R., May, 1918, p. 51, figures are given for the edible dried pea production in the five important producing states, Michigan, Wisconsin, Idaho, Washington, and Colorado, for the years 1916–17 and 1917–18. These states cover practically the whole of the commercial crop. Working from these figures and census returns as a basis, estimates have been made for the other years. In each case one-fourth of the estimated crop has been deducted for seed and losses in storage and handling. This deduction might seem large, at first thought, but it must be remembered that a fair proportion of the dried pea crop goes as seed for the green pea crop used in canning.

11. Potatoes.—The basic statistics for potato production were derived from the following sources: 1911–12 to 1915–16 inclusive D.A.Y.B., 1916, p. 614; 1916–17 and 1917–18, M.C.R., December, 1917, p. 117. From the figures as given in these sources we have deducted one-third of the crop in each year to allow for (*a*) seed and (*b*) spoilage and wastage. The residual values are then converted to nutrients.

12. Sweet Potatoes.—The crop statistics for sweet potatoes are given in D.A.Y.B., 1916, p. 617, for the years 1911–12 to 1916–17, inclusive. For 1917–18 the figure was taken from M.C.R., December, 1917, p. 117. A deduction of one-third of the crop is made in each year to allow for seed and spoilage and wastage in handling. The residue is converted to nutrient values.

13. Onions.—Statistics on the onion crop were first published by the Department of Agriculture for the year 1914–15. The sources of the data for that and following years are: 1914–15, M.C.R., November, 1915, p. 73; 1915–16, *ibid.*, August, 1916, p. 80; 1916–17 and 1917–18, *ibid.*, December, 1917, p. 117. The returns are for 13 states (12 in 1914–15) only, but cover practically the whole of the commercial crop. The crop of onions is highly variable in amount if one may judge from the four years for which figures are available. This makes estimating the crop of the missing years very difficult. The crops of the missing years, however, probably did not deviate far from the average of the four years for which data are available. On this basis, conservative estimates, erring almost surely in the direction of under-statement, have been

made for the three years 1911–12 to 1913–14, inclusive. In all cases a deduction of one-fourth of the crop has been made to allow for spoilage, loss in storage and transit, etc.

14. Cabbage.—Cabbage crop statistics were started by the Department of Agriculture first for the year 1914–15. The figures for that year are given in M.C.R., November, 1915, p. 73. For the year 1915–16 the reference is M.C.R., September, 1916, p. 92. The data for the last two years are given in M.C.R., December, 1917, p. 117. The statistics are for the crop produced in nine states, but cover practically the whole of the commercial crop. Before calculating the nutrients one-third of the estimated crop for each year is deducted for loss in storage and handling. On the basis of existing information for the last four years the three preceding years have been estimated.

15. Canned Peas.—The statistics for the production of canned peas were taken from "The Canning Trade Almanac of the Canning Industry, 1918" for the years 1911–12 to 1916–17, inclusive. The statistics are collected by the National Canners' Association under the personal supervision of the Secretary, Mr. Frank Gorrell. For the last year the production was reported to the Statistical Division of the Food Administration by each canner, and the statistics compiled by that Division. No deductions were made from the total production figures in calculating the nutrients. It should be understood that the canned pea pack does not nutritionally duplicate anything in the item "Dried Peas" given above. They are a separate and distinct production.

16. Canned Corn.—The sources and method of handling the data were precisely the same for canned corn as for canned peas above.

17. Canned Tomatoes.—The sources and method of handling the data were the same for this commodity as for canned peas and canned corn.

SACCHARINE MATERIALS

18. Beet Sugar.—This item includes the best sugar produced in the continental area of the United States. The sources of the statistics are as follows: for the years 1911–12 to 1915–16, inclusive, D.A.Y.B., 1916, p. 643; 1916–17 and 1917–18, M.C.R., July, 1918, p. 76. No deductions are made from this item in converting to nutrients. The carbohydrate content is taken as 100 per cent.

19. Domestic Cane Sugar.—This item includes the Louisiana cane sugars. It is given as a separate item because the carbohydrate

content of these sugars is less than 100 per cent. We have taken as a fair average carbohydrate content for all these sugars 95 per cent. No deduction from the production is made in calculating the nutrients. The source of the statistics is for the years 1911–12 to 1916–17, inclusive, M.C.R., May, 1917, p. 42; for 1917–18, Willett and Gray's Weekly Statistical Sugar Trade Journal, March 21, 1918, p. 128.

20. Molasses.—This item includes the molasses *produced in the United States* from sugars from the following sources: U. S. Cane, U. S. Beet, Hawaii, Porto Rico, and Cuba. The imports of sugar from the last three sources are computed in Chapter VI as *refined* sugar, and hence in counting the molasses as domestic production (which it is in the sense that it is made here) we are making no nutritional duplication. Molasses varies greatly in its sucrose content. As a fair general average we have taken the carbohydrate content of all molasses at 65 per cent. This is conservative, as Atwater and Bryant (p. 64) give the average as 69.3. We have lowered this because of Leach's (p. 568) data based on a larger number of analyses, showing a greater range of variation and a lower minimum value. (See also Henry and Morrison, p. 637.) Molasses is stated to have a "protein" content of from 2 to 4 per cent. Really, however, this is chiefly nitrogenous material not nutritionally available. Henry and Morrison (p. 186) say, regarding this point: "The crude protein of both beet and cane molasses consists largely of compounds having little nutritive value." It appears ridiculous in face of these facts to include the fairly large number of tons of protein which would result from applying the Atwater-Bryant factor to the total molasses production. We have accordingly called the protein and fat content of molasses zero. This gives a fuel value per pound of 1209 calories.

The statistics of production used were compiled by Mr. Joshua Bernhardt, the sugar statistician of the Statistical Division of the Food Administration, from information from a variety of trade and technical sources, and from Department of Agricultural figures. The really difficult problem with molasses is the proper allocation of the total crop between the following general classes of use, (*a*) human food, (*b*) stock feed, (*c*) industrial alcohol. On this point the advice of Dr. C. L. Alsberg, Chief of the Bureau of Chemistry of the Department of Agriculture, of Mr. George M. Rolph, Head of the Sugar Division of the Food Administration, and Dr. William Marshall, Controller of the International Sugar Committee,

has been obtained. The net result of our investigation of the matter is embodied in the following percentage allocation scheme, which has been made the basis of the deductions in the molasses item in Table 7.

	Per cent. to human food uses	Per cent. to stock feed		Per cent. to alcohol	
Domestic cane	50		25		25
Domestic beet	0		50		50
Refiners' molasses and syrups	42	1911–14	32	1911–14	26
		1914–17	17	1914–17	41

21. Glucose and Grape Sugar. The figures on the production of liquid glucose and grape sugar were arrived at from information given in the Census of Manufactures and from a special questionnaire sent to glucose manufacturers at the request of the writer by Mr. George S. Mahana of New York. On this basis of information obtained from the manufacturers as to their sales, 4 per cent. of the production in each year was deducted for non-food industrial uses. An average carbohydrate content of 85 per cent. was assumed in the conversion to nutrient values.

22. Honey.—There are no official statistics of honey production. Dr. E. F. Phillips of the Bureau of Entomology of the U. S. Department of Agriculture, who has for many years been in charge of agricultural investigations, estimates that during the period covered by the present study 250,000,000 lb. fairly estimates the average annual production. We have accordingly adopted this figure. No deductions are made.

23. Sorghum Syrup. This commodity is rather extensively used in the South as a sweetening agent. The production figures are from M.C.R., October, 1916, p. 102, for the years 1911–12 to 1915–16, inclusive, and from M.C.R., December, 1917, p. 117. The average carbohydrate content, as furnished by the Bureau of Chemistry, is 68.1 per cent.

24. Maple Sugar.—Statistics are available only for the census year, 1909, and for the years 1917–18 and 1918–19 (M.C.R., June, 1918, p. 61). From these data estimates have been made for the other years. No deductions have been made.

25. Maple Syrup.—The sources and treatment are the same as for maple sugar.

FRUITS

26. Apples.—The production statistics for apples were taken, for the years 1911–12 to 1915–16, inclusive, from D.A.Y.B., 1916, p. 635; for the years 1916–17 and 1917–18 from M.C.R., December, 1917, p. 117. Before calculating nutrient values one-third of the crop in each year was deducted for wastage and spoilage.

27. Peaches.—The statistics of production for this crop were taken from D.A.Y.B., 1916, p. 637, for the years 1911–12 and 1915–16, inclusive, and for the years 1916–17 and 1917–18 from M.C.R., December, 1917, p. 117. A deduction of one-third of the crop was made for spoilage and wastage.

28. Pears.—Statistics on the production of pears were only started by the Department of Agriculture in 1914–15. For that year the data were taken from M.C.R., November, 1915, p. 65; for the year 1915–16 from M.C.R., August, 1916, p. 80; and for the last two years from M.C.R., December, 1917, p. 117. The production in the years prior to 1914–15 was estimated from a fitted straight line. In each year one-third of the crop was deducted for wastage and spoilage.

29. Oranges.—Official statistics on the commercial production of oranges begin only in 1916–17 and were taken from M.C.R., December, 1917, p. 117. The production in earlier years has been estimated on the basis of the two known years and census returns in 1909. One-fifth of the crop is deducted for spoilage and wastage. It should be remembered that we are dealing here with statistics of a commercial pack and not with a total crop as in apples, some of which never even harvested, and consequently it is proper to make a smaller deduction than in the other fruits.

29*a*. Prunes.—The statistics of production of this, and the two following dried fruit crops, are taken from the California Annual, Vol. 2, No. 1, June 15, 1918. This is a publication of the California Packing Corporation. While the figures are trade rather than official estimates they are probably as accurate as other crop estimates. In any case they are the only data available on these crops.

29*b*. Raisins.

29*c*. Apricots, dried.

VEGETABLE OILS AND NUTS

Here we shall include as oils only cottonseed, corn, cocoanut, and olive oils. The other vegetable oils *produced* in this country are too small in amount in respect of human food use to be significant and detailed statistics regarding such minor items are largely

lacking. Furthermore it is possible to take account of the more important of them by the procedure followed with peanuts, where the fat content of the original crop is counted. It would be impossible accurately to divide the fat content of the peanut crop between peanuts as such and expressed oil, because of lack of sufficiently accurate and detailed statistics. But such procedure is wholly unnecessary because the whole fat content is accounted for by the method here used.

Other than the direct consumption as oil, the chief forms in in which vegetable oils and fats are consumed as food in this country are oleomargarine and lard substitutes. Oleomargarine is carried as a separate item under Secondary Foods (cf. Chapter IV) and in the duplication of cottonseed and cocoanut oils which is thus brought about there is a safe allowance for the unenumerated minor oils. The chief vegetable oils used in lard substitutes are cottonseed, corn, and peanut oils, all of which are fully counted here.

30. Peanuts.—Peanuts constitute the only nut crop sufficient in magnitude to be significant in the nutritional sense. Official statistics on this crop have only been published by the Department of Agriculture during the past two years (M.C.R., December, 1917, p. 126). Before that time only census data are available. We have made estimates for the earlier years, on the assumption that the increase in the peanut crop was evenly distributed in time prior to 1916. In all cases 15 per cent. of the crop is deducted for seed and loss in harvesting, storage, and handling.

The distribution of the nutrient value of the peanut crop presents a difficult problem. Of the portion of the peanut crop actually *harvested* as grain, which is what the statistics here given refer to, comparatively little is fed to livestock,[1] though a large proportion of the crop as *grown* is so fed.

The Fat and Oil Survey of the U. S. Food Administration furnishes figures on the peanut oil production. Working back from these figures the portion of the crop pressed for oil has been calculated. From this fraction of the crop there goes to human nutrition 75 per cent. of the fat content (data from Fat and Oil Survey) and none of the protein or carbohydrate. Of the balance of the harvested crop we have estimated that 90 per cent. of all the nutrient material goes to human food, and 10 per cent. to fodder. The nutrients, as they appear in Table 7, have been calculated on

[1] As we are informed by a practical Southern farmer of wide experience.

this basis. It is obvious that these are rough estimates, but it seems impossible to get more accurate information.

In the matter of analysis difficulty was experienced because of the wide discrepancies between published figures. Atwater and Bryant (p. 75) give a fat content of the whole nut, as purchased, of 29.1 per cent. This is obviously too low, as is evident from known facts as to the yield of peanut oil in crushing. Generally speaking the yield is 40 to 50 lb. of oil per 100 lb. shelled nuts.[1] Atwater and Bryant give the inedible refuse (shells) as 24.5 per cent. of total weight. It is then clear that nothing like the actual oil recoveries could be got from this 29.1 per cent. After thorough study of all the available analyses it has been decided to use throughout this book, the following figures for the nutrient content of whole peanuts with shell (unhulled) as purchased.

Protein	19.5 per cent.
Fat	33.2 per cent.
Carbohydrate	14.4 per cent.

These figures correspond to a commercial oil yield of 40 lb. per 100 lb. of peanuts with hulls removed, which is conservative.

31. Cottonseed Oil.—The basic statistics were the production of crude oil in each year as given in "Cotton Production and Distribution, Season of 1916–17" (Bureau of the Census, Bulletin 135, 1918), for all the years up to 1917–18. In this last year the total production was estimated from the known production to June 30, 1918. The crop year for cottonseed oil is from August 1 to July 31, inclusive. From the total crude oil produced was deducted in each year the amount used for non-food industrial purposes, chiefly soap-making. The balance remaining was converted to refined oil and the nutrient values calculated. The deductions for industrial uses were made on the basis of information contained in the Fat and Oil Survey.

32. Corn Oil.—The only available statistics on this product are given in the Census of Manufactures at quinquennial periods. A straight line was fitted by least squares to the 1909 and 1914 data and the other years read off from this line. The Fat and Oil Survey indicates that there is no appreciable quantity of *refined* corn oil used for non-food purposes, and therefore no deductions are made from the total production of refined oil here given.

[1] Johns, C. O. and Jones, D. B., *Proc. Nat. Acad. Sci., Vol.* 3, p. 365, 1917. Also Armsby, H. P., "The Conservation of Food Energy," Philadelphia, 1918, p. 52.

33. Cocoanut Oil.—This is a product which has been manufactured in this country for edible purposes only in recent years. The figures for production were obtained from the Food Administration's Fat and Oil Survey and from the Bureau of Chemistry of the Department of Agriculture. Only the edible oil is taken account of. The much larger portion of the total production used for non-food industrial purposes is not included here.

34. Olive Oil.—The statistics for this commodity are derived from the Fat and Oil Survey of the U. S. Food Administration. Only the edible oil production is taken, and therefore no deduction is made for industrial uses.

FISH

35. Fish.—There are no official statistics as to the total catch of fish in this country. I have accordingly asked the U. S. Bureau of Fisheries to help in arriving at an estimate in this matter. After careful consideration they state that during the years covered by this study the best estimate they can make is that the average annual catch amounted to 2,000,000,000 lb., including all salt and fresh water fish, shell fish, etc., privately caught and locally consumed, as well as commercially caught. The figure also includes all canned fish.

In arriving at nutritional figures for this lump catch, it has seemed advisable to work with the edible portions only, deducting the refuse at one operation. For twenty-five leading varieties of fish and shellfish Atwater and Bryant's figures yield an average refuse percentage of 48.184. We have accordingly reduced the 2,000,000,000 lb. gross catch by this percentage. For the same twenty-five varieties we have determined the average analytical results for edible portion, as given by Atwater and Bryant, with the following results.

Protein	17.2 per cent.
Fat	3.9 per cent.
Calories	497 per lb.

These factors have been applied to the figures as given.

Table 6 gives in detail the conversion factors used. Since in this study conversions were first made to short tons of 2000 lb. the table is presented in that form. The results were then converted to metric tons by multiplying by the factor 0.9072.

TABLE 6.—FACTORS BY WHICH QUANTITIES IN THE SPECIFIED ORIGINAL UNIT OF MEASURE OF THE COMMODITIES NAMED ARE TO BE MULTIPLIED TO GET THE CONTAINED AMOUNT OF PROTEIN, FAT AND CARBOHYDRATE IN SHORT TONS OF 2000 LBS. TO CONVERT TO METRIC TONS MULTIPLY EITHER THE RESULT IN SHORT TONS, OR THE FACTORS IN THIS TABLE, BY 0.9072

Reference No.	Commodity	Original specified unit of measure	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
1	Corn meal	bbl.	0.007350	0.004116	0.064582	0.302306
2	Hominy as corn	bu.	0.001369	0.000099	0.013035	0.054450
3	Wheat (nutrients in flour only)*	bu.	0.002483	0.000218	0.016357	0.071925
4	Oatmeal	lb.	0.000081	0.000036	0.000337	0.001860
5	Barley meal	lb.	0.000053	0.000011	0.000364	0.001640
6	Rye flour	bbl.	0.006664	0.000882	0.077126	0.319480
7	Buckwheat flour	lb.	0.000032	0.000006	0.000389	0.001620
8	Rice	lb.	0.000040	0.000001	0.000395	0.001631
9	Beans	bu.	0.006750	0.000540	0.017880	0.096300
10	Peas (other than canned)	bu.	0.007380	0.000300	0.018600	0.099300
11	Potatoes	bu.	0.000540	0.000030	0.004410	0.018667
12	Sweet potatoes	bu.	0.000385	0.000165	0.006023	0.025360
13	Onions	bu.	0.000392	0.000084	0.002492	0.011437
14	Cabbages	short tons	0.014000	0.002000	0.048000	0.250000
15	Canned peas	cases (30 lb.)	0.000540	0.000030	0.001470	0.007650
16	Canned corn	cases (30 lb.)	0.000420	0.000180	0.002850	0.013650
17	Canned tomatoes	cases (51 lb.)	0.000306	0.000051	0.001020	0.005355
18	Beet sugar	short tons	0	0	1.000000	3.720000
19	Domestic cane sugar	short tons	0	0	0.950000	3.534000
20	Molasses	gal.	0	0	0.003575	0.013299
21	Glucose and grape sugar	lb.	0	0	0.000425	0.001581
22	Honey	lb.	0.000002	0	0.000406	0.001520
23	Sorghum syrup	gal.	0	0	0.003916	0.014567
24	Maple sugar	lb.	0	0	0.000414	0.001540
25	Maple syrup	gal.	0	0	0.003952	0.014723
26	Apples	bbl.	0.000216	0.000216	0.007776	0.031680
27	Peaches	bu.	0.000120	0.000024	0.001848	0.007440
28	Pears	bu.	0.000120	0.000096	0.002736	0.010992
29	Oranges	boxes	0.000136	0.000034	0.002618	0.010404
29a	Prunes	short tons	0.018000	0	0.622000	2.380000
29b	Raisins	short tons	0.023000	0.030000	0.685000	2.890000
29c	Apricots, dried	short tons	0.047000	0.010000	0.625000	2.580000
30	Peanuts**	bu.	0.000097	0.000166	0.000072	***
31	Cottonseed oil	lb.	0	0.000490	0	0.004136
32	Corn oil	gal.	0	0.003797	0	0.032054
33	Cocoanut oil	lb.	0	0.000490	0	0.004136
34	Olive oil	lb.	0	0.000490	0	0.004136
35	Fish	lb.	0.000086	0.000019	0	0.000497

* These conversion factors for wheat flour were used for all years except 1917–18. In that year, on account of the higher milling extraction, the factors became: Protein = 0.002531, fat = 0.000222, carbohydrate = 0.016672, calories = 0.073309.

** See text, p. 43, for treatment of peanut crop. The factors here given relate only to whole peanuts and are 90 per cent. of total nutrient values.

*** Calories calculated from final total nutrients as given in Table 7.

We come now to the consideration of Table 7 which gives the detailed results for primary foods.

TABLE 7.—SHOWING THE PRIMARY FOOD PRODUCTION OF THE UNITED STATES FROM 1911–12 TO 1917–18, INCLUSIVE

Reference No.	Commodity	Original units	1911–12 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	26,536,285	2,359,208	176,940	99,086	1,554,711	8,022,609
2	Hominy as corn	bu.	25,832,000	656,159	32,082	2,320	305,469	1,406,552
3	Wheat (nutrients in flour)	bu.	506,806,455	13,793,143	1,141,608	100,230	7,520,454	36,452,054
4	Oatmeal	lb.	297,031,770	134,733	21,827	9,701	90,810	552,479
5	Barley meal	lb.	22,731,000	10,311	1,093	227	7,506	37,279
6	Rye flour	bbl.	1,694,237	150,626	10,242	1,355	118,543	541,275
7	Buckwheat flour	lb.	155,898,000	70,715	4,526	848	55,016	252,555
8	Rice	lb.	425,555,000	193,030	15,442	386	152,493	694,080
	Sub-total—Grains	.....	.....	17,367,925	1,403,760	214,153	9,805,002	47,958,883
	Vegetables							
9	Beans	bu.	7,500,000	204,119	45,926	3,674	121,654	722,250
10	Peas (other than canned)	bu.	1,732,500	47,151	11,599	472	29,234	172,037
11	Potatoes	bu.	195,256,000	5,314,087	95,652	5,314	781,162	3,044,844
12	Sweet potatoes	bu.	36,377,000	907,533	12,705	5,445	198,764	920,338
13	Onions	bu.	9,375,000	238,138	3,334	714	21,195	107,222
14	Cabbage	short tons	326,000	295,744	4,140	591	14,196	81,500
15	Canned peas	cases (30 lb.)	4,532,000	61,671	2,220	123	6,044	34,670
16	Canned corn	cases (30 lb.)	14,301,000	194,608	5,449	2,335	36,975	195,209
17	Canned tomatoes	cases (51 lb.)	9,749,000	225,524	2,706	451	9,021	52,206
	Sub-total—Vegetables	.....	.....	7,488,575	183,731	19,119	1,218,245	5,930,276
	Saccharine Materials							
18	Beet sugar	short tons	599,500	543,860	.....	.....	543,860	2,230,140
19	Domestic cane sugar	short tons	360,874	327,381	.....	.....	311,012	1,275,329
20	Molasses	gal.	48,618,461	242,585	.....	.....	157,680	646,577
21	Glucose and grape sugar	lb.	923,520,000	418,906	.....	.....	356,068	1,460,085
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	15,448,000	80,582	.....	.....	54,880	225,031
24	Maple sugar	lb.	12,900,000	5,851	.....	.....	4,845	19,866
25	Maple syrup	gal.	4,149,900	20,838	.....	.....	14,878	61,099
	Sub-total—Sugars	.....	.....	1,753,402	454	.....	1,535,303	6,298,127
	Fruits							
26	Apples	bbl.	47,584,000	3,108,092	9,324	9,324	335,672	1,507,461
27	Peaches	bu.	23,265,000	506,549	2,533	506	39,004	173,092
28	Pears	bu.	7,866,667	171,279	856	685	19,525	86,470
29	Oranges	boxes	13,952,800	430,369	1,722	430	33,138	145,165
29*a*	Prunes	short tons	89,000	80,740	1,453	.....	50,220	211,820
29*b*	Raisins	short tons	75,000	68,039	1,565	2,041	46,607	216,750
29*c*	Apricots, dried	short tons	6,500	5,897	277	59	3,685	16,770
	Sub-total—Fruits	.....	.....	4,370,965	17,730	13,045	527,851	2,357,528
	Vegetable Oils and Nuts							
30	Peanuts	bu.	20,230,000	201,878	35,156	60,280	26,095	811,980
31	Cottonseed oil	lb.	1,326,985,000	601,916	.....	589,876	.....	5,488,410
32	Corn oil	gal.	8,443,137	29,492	.....	29,084	.....	270,636
33	Cocoanut oil	lb.	.....	.....	.....	.....	.....	.....
34	Olive oil	lb.	900,000	408	.....	400	.....	3,722
	Sub-total—Oils and Nuts		.....	833,694	35,156	679,640	26,095	6,574,748
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	32,284,633	1,721,683	943,820	13,112,496	69,634,615

*Less deductions as per text explanation of each item.

TABLE 7—*Continued*

Reference No.	Commodity	Original units	1912–13 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	26,161,604	2,325,897	174,442	97,688	1,532,760	7,909,333
2	Hominy as corn	bu.	26,176,000	664,897	32,509	2,351	309,537	1,425,283
3	Wheat (nutrients in flour)	bu.	607,244,104	16,526,634	1,367,849	120,093	9,010,839	43,676,032
4	Oatmeal	lb.	333,509,400	151,279	24,507	10,892	101,962	620,327
5	Barley meal	lb.	19,821,000	8,991	953	198	6,545	32,506
6	Rye flour	bbl.	1,775,286	157,832	10,733	1,421	124,213	567,168
7	Buckwheat flour	lb.	145,806,000	66,137	4,233	794	51,455	236,206
8	Rice	lb.	469,741,000	213,073	17,046	426	168,327	766,148
	Sub-total—Grains	.....	.....	20,114,740	1,632,272	233,863	11,305,638	55,233,003
	Vegetables							
9	Beans	bu.	7,725,000	210,242	47,304	3,784	125,304	743,917
10	Peas (other than canned)	bu.	1,792,500	48,784	12,001	488	30,247	177,995
11	Potatoes	bu.	280,572,000	7,636,048	137,447	7,636	1,122,487	5,237,438
12	Sweet potatoes	bu.	37,604,000	923,176	12,924	5,539	202,190	936,201
13	Onions	bu.	9,750,000	247,664	3,467	743	22,042	111,511
14	Cabbage	short tons	333,333	302,396	4,234	605	14,515	83,333
15	Canned peas	cases (30 lb.)	7,307,000	99,434	3,580	199	9,744	55,899
16	Canned corn	cases (30 lb.)	13,109,000	178,387	4,995	2,141	33,894	178,938
17	Canned tomatoes	cases (51 lb.)	14,022,000	324,371	3,893	649	12,975	75,088
	Sub-total—Vegetables	.....	.....	9,970,502	229,845	21,784	1,573,398	7,600,320
	Saccharine Materials							
18	Beet sugar	short tons	692,556	628,280	.....	.....	628,280	2,576,308
19	Domestic cane sugar	short tons	162,573	147,485	.....	.....	140,110	574,533
20	Molasses	gal.	42,570,735	212,410	.....	.....	138,065	566,148
21	Glucose and grape sugar	lb.	941,760,000	427,180	.....	.....	363,101	1,488,925
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	15,168,000	79,122	.....	.....	53,885	220,952
24	Maple sugar	lb.	12,750,000	5,783	.....	.....	4,789	19,635
25	Maple syrup	gal.	4,177,100	20,975	.....	.....	14,976	61,499
	Sub-total—Sugars	.....	.....	1,634,634	454	.....	1,435,286	5,887,998
	Fruits							
26	Apples	bbl.	52,297,000	3,415,935	10,248	10,248	368,919	1,656,769
27	Peaches	bu.	34,913,000	766,161	3,801	760	58,531	259,753
28	Pears	bu.	7,880,000	171,569	858	686	19,559	86,617
29	Oranges	boxes	13,952,800	430,369	1,722	430	33,138	145,165
29a	Prunes	short tons	108,000	97,977	1,764	0	60,941	257,040
29b	Raisins	short tons	101,500	92,080	2,118	2,762	63,075	293,335
29c	Apricots, dried	short tons	18,400	16,692	785	167	10,433	47,472
	Sub-total—Fruits	.....	.....	4,984,783	21,296	15,053	614,596	2,746,151
	Vegetable Oils and Nuts							
30	Peanuts	bu.	22,185,000	221,387	38,535	66,098	28,604	890,244
31	Cottonseed oil	lb.	1,209,125,000	548,455	.....	537,484	.....	5,000,941
32	Corn oil	gal.	8,582,618	29,979	.....	29,563	.....	275,107
33	Cocoanut oil	lb.	.....	.....	.....	.....	.....	.....
34	Olive oil	lb.	964,000	437	.....	428	.....	3,987
	Sub-total—Oils and Nuts	.....	.....	800,258	38,535	633,573	28,604	6,170,279
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	37,974,989	2,003,254	922,136	14,957,522	78,152,802

* Less deductions as per text explanation of each item.

TABLE 7—*Continued*

Reference No.	Commodity	Original units	1913–14 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	25,782,713	2,292,212	171,915	96,272	1,510,562	7,794,785
2	Hominy as corn	bu.	26,520,000	673,635	32,936	2,381	313,605	1,444,014
3	Wheat (nutrients in flour)	bu.	634,500,238	17,268,432	1,429,245	125,483	9,415,290	45,636,430
4	Oatmeal	lb.	359,534,250	163,084	26,419	11,742	109,918	668,734
5	Barley meal	lb.	16,911,000	7,671	813	169	5,585	27,734
6	Rye flour	bbl.	1,856,335	165,037	11,223	1,485	129,884	593,062
7	Buckwheat flour	lb.	135,714,000	61,559	3,940	738	47,893	219,357
8	Rice	lb.	491,102,000	222,762	17,821	445	175,981	800,987
	Sub-total—Grains	.....	.....	20,854,392	1,694,312	238,715	11,708,718	57,185,103
	Vegetables							
9	Beans	bu.	8,625,000	218,407	49,141	3,931	130,170	772,807
10	Peas (other than canned)	bu.	1,845,000	50,213	12,352	502	31,132	183,209
11	Potatoes	bu.	221,127,000	6,018,192	108,327	6,018	884,664	4,127,778
12	Sweet potatoes	bu.	39,391,000	982,727	13,758	5,897	215,233	996,592
13	Onions	bu.	10,125,000	257,189	3,601	772	22,889	115,800
14	Cabbage	short tons	340,667	309,050	4,326	618	14,834	85,167
15	Canned peas	cases (30 lb.)	8,770,000	119,342	4,296	239	11,695	67,091
16	Canned corn	cases (30 lb.)	7,283,000	99,107	2,775	1,189	18,831	99,413
17	Canned tomatoes	cases (51 lb.)	14,206,000	328,627	3,944	658	13,145	76,073
	Sub-total—Vegetables	.....	.....	8,382,854	202,520	19,824	1,342,593	6,523,930
	Saccharine Materials							
18	Beet sugar	short tons	733,401	665,334	.....	.....	665,334	2,728,252
19	Domestic cane sugar	short tons	300,498	272,609	.....	.....	258,978	1,061,960
20	Molasses	gal.	53,838,286	268,630	.....	.....	174,609	715,995
21	Glucose and grape sugar	lb.	961,920,000	436,324	.....	.....	370,874	1,520,796
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	13,182,000	68,762	.....	.....	46,830	192,022
24	Maple sugar	lb.	12,600,000	5,715	.....	.....	4,732	19,404
25	Maple syrup	gal.	4,204,400	21,112	.....	.....	15,074	61,901
	Sub-total—Sugars	.....	.....	1,851,885	454	.....	1,628,511	6,680,330
	Fruits							
26	Apples	bbl.	32,329,000	2,111,666	6,335	6,335	228,059	1,024,183
27	Peaches	bu.	26,485,000	576,658	2,883	577	44,401	197,048
28	Pears	bu.	7,960,000	173,311	866	693	19,758	87,496
29	Oranges	boxes	13,952,800	430,369	1,722	430	33,138	145,165
29a	Prunes	short tons	66,500	60,328	1,086	0	37,524	158,270
29b	Raisins	short tons	75,000	68,039	1,565	2,041	46,607	216,750
29	Apricots, dried	short tons	10,600	9,616	452	96	6,010	27,348
	Sub-total—Fruits	.....	.....	3,429,987	14,909	10,172	415,497	1,856,260
	Vegetable Oils and Nuts							
30	Peanuts	bu.	24,140,000	240,896	41,903	71,910	31,103	968,380
31	Cottonseed oil	lb.	1,258,510,000	570,856	.....	559,437	.....	5,205,197
32	Corn oil	gal.	8,722,099	30,466	.....	30,044	.....	279,578
33	Cocoanut oil	lb.	150,000	68	.....	66	.....	620
34	Olive oil	lb.	1,042,000	473	.....	464	.....	4,310
	Sub-total—Oils and Nuts	.....	.....	842,759	41,903	661,921	31,103	6,458,085
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	35,831,949	2,034,950	948,495	15,126,422	79,218,759

* Less deductions as per text explanation of each item.

TABLE 7—*Continued*

Reference No.	Commodity	Original Units	1914–15 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	25,765,125	2,290,648	171,798	96,207	1,509,531	7,789,467
2	Hominy as corn	bu.	26,864,000	682,372	33,364	2,413	317,672	1,462,745
3	Wheat (nutrients in flour)	bu.	744,227,710	20,254,753	1,676,412	147,184	11,043,526	53,528,578
4	Oatmeal	lb.	398,627,370	180,816	29,292	13,019	121,869	741,447
5	Barley meal	lb.	14,000,789	6,351	673	140	4,623	22,961
6	Rye flour	bbl.	1,937,385	172,243	11,713	1,550	135,555	618,956
7	Buckwheat flour	lb.	125,622,189	56,982	3,647	683	44,332	203,508
8	Rice	lb.	424,618,000	192,605	15,409	386	152,158	692,552
	Sub-total—Grains	.....	.....	23,836,770	1,942,308	261,582	13,329,266	65,060,214
	Vegetables							
9	Beans	bu.	8,689,000	236,480	53,207	4,257	140,940	836,751
10	Peas (other than canned)	bu.	1,912,500	52,050	12,804	521	32,271	189,911
11	Potatoes	bu.	273,417,000	7,441,317	133,942	7,442	1,093,862	5,103,875
12	Sweet potatoes	bu.	37,735,000	941,413	13,180	5,648	206,184	954,695
13	Onions	bu.	16,426,000	424,694	5,841	1,252	37,135	187,864
14	Cabbage	short tons	510,697	463,299	6,486	927	22,238	127,674
15	Canned peas	cases (30 lb.)	8,847,000	120,390	4,334	240	11,798	67,680
16	Canned corn	cases (30 lb.)	9,789,000	133,209	3,729	1,598	25,310	133,620
17	Canned tomatoes	cases (51 lb.)	15,222,000	352,131	4,226	704	14,085	81,514
	Sub-total—Vegetables	.....	.....	10,164,983	237,749	22,589	1,583,823	7,683,584
	Saccharine Materials							
18	Beet sugar	short tons	722,054	655,040	.....	.....	655,040	2,686,041
19	Domestic cane sugar	short tons	246,620	223,731	.....	.....	212,545	871,53[illegible]
20	Molasses	gal.	32,110,556	160,218	.....	.....	104,141	427,03[illegible]
21	Glucose and grape sugar	lb.	980,687,798	444,837	.....	.....	378,110	1,550,467
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	13,551,000	70,687	.....	.....	48,141	197,397
24	Maple sugar	lb.	12,400,600	5,625	.....	.....	4,658	19,0[illegible]
25	Maple syrup	gal.	4,231,600	21,248	.....	.....	15,171	62,30[illegible]
	Sub-total—Sugars	.....	.....	1,694,785	454	.....	1,509,886	6,[illegible]
	Fruits							
26	Apples	bbl.	56,295,000	3,677,077	11,031	11,031	397,122	1,783,426
27	Peaches	bu.	36,091,000	785,809	3,929	786	60,506	268,517
28	Pears	bu.	8,061,000	175,512	877	702	20,008	88,607
29	Oranges	boxes	13,952,800	430,369	1,722	430	33,138	145,165
30	Prunes	short tons	58,000	52,617	947	0	32,728	138,040
31	Raisins	short tons	84,800	76,930	1,769	2,308	52,697	245,072
32	Apricots, dried	short tons	19,800	17,962	844	180	11,226	51,084
	Sub-total—Fruits	.....	.....	5,216,276	21,119	15,437	607,425	2,719,911
	Vegetable Oils and Nuts							
33	Peanuts	bu.	26,010,000	259,557	45,096	77,457	33,473	1,042,797
34	Cottonseed oil	lb.	1,498,755,000	679,831	.....	666,231	.....	6,198,851
35	Corn oil	gal.	8,861,579	30,953	.....	30,524	.....	284,049
36	Cocoanut oil	lb.	960,000	435	.....	426	.....	3,971
37	Olive oil	lb.	1,126,000	511	.....	501	.....	4,657
	Sub-total—Oils and Nuts	.....	.....	971,287	45,096	775,139	33,473	7,534,325
38	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	42,354,173	2,327,578	1,092,610	17,063,873	89,706,981

* Less deductions as per text explanation of each item.

TABLE 7—*Continued*

1915-16

Reference No.	Commodity	Original Units	Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	25,611,958	2,277,031	170,776	95,635	1,500,558	7,743,161
2	Hominy as corn	bu.	27,208,000	691,110	33,791	2,444	321,740	1,481,476
3	Wheat (nutrients in flour)	bu.	875,112,207	23,816,879	1,971,237	173,068	12,985,708	62,942,446
4	Oatmeal	lb.	439,362,900	199,294	32,285	14,349	134,323	817,215
5	Barley meal	lb.	11,091,000	5,031	533	111	3,662	18,189
6	Rye flour	bbl.	2,018,433	179,449	12,203	1,615	141,226	644,849
7	Buckwheat flour	lb.	115,530,000	52,404	3,354	628	40,770	187,159
8	Rice	lb	588,305,000	266,853	21,348	533	210,812	959,525
	Sub-total—Grains	.....	.....	27,488,051	2,245,527	288,383	15,338,799	74,794,020
	Vegetables							
9	Beans	bu.	7,741,000	210,679	47,402	3,792	125,563	745,458
10	Peas (other than canned)	bu.	1,980,000	53,887	13,256	539	33,410	196,614
11	Potatoes	bu.	239,934,000	6,530,044	117,539	6,530	959,906	4,478,848
12	Sweet potatoes	bu.	50,451,000	1,258,652	17,621	7,551	275,665	1,276,410
13	Onions	bu.	7,562,000	195,516	2,689	576	17,096	86,487
14	Cabbage	short tons	452,470	410,476	5,747	821	19,703	113,117
15	Canned peas	cases (30 lb.)	9,272,000	126,173	4,542	252	12,365	70,931
16	Canned corn	cases (30 lb.)	10,124,000	137,767	3,857	1,653	26,175	138,193
17	Canned tomatoes	cases (51 lb.)	8,469,000	195,913	2,351	392	7,836	45,351
	Sub-total—Vegetables	.....	.....	9,119,107	215,004	22,106	1,477,719	7,151,409
	Saccharine Materials							
18	Beet sugar	short tons	874,220	793,084	.....	.....	793,084	3,252,098
19	Domestic cane sugar	short tons	138,620	125,755	.....	.....	119,467	489,883
20	Molasses	gal.	29,344,951	146,419	.....	.....	95,171	390,259
21	Glucose and grape sugar	lb.	1,065,600,000	483,353	.....	.....	410,848	1,684,714
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	14,823,000	77,322	.....	.....	52,660	215,927
24	Maple sugar	lb.	12,300,000	5,579	.....	.....	4,619	18,942
25	Maple syrup	gal.	4,250,000	21,341	.....	.....	15,237	62,573
	Sub-total—Sugars	.....	.....	1,766,252	454	.....	1,583,166	6,494,396
	Fruits							
26	Apples	bbl.	51,139,000	3,340,297	10,021	10,021	360,750	1,620,084
27	Peaches	bu.	42,753,000	930,861	4,654	931	71,675	318,082
28	Pears	bu.	7,481,000	162,884	815	651	18,568	82,231
29	Oranges	boxes	13,952,800	430,369	1,722	430	33,138	145,165
29*a*	Prunes	short tons	89,000	80,740	1,453	0	50,220	211,820
29*b*	Raisins	short tons	138,000	125,192	2,879	3,756	85,757	398,820
29*c*	Apricots, dried	short tons	17,900	16,239	763	162	10,149	46,182
	Sub-total—Fruits	.....	.....	5,086,582	22,307	15,951	630,257	2,822,384
	Vegetable Oils and Nuts							
30	Peanuts	bu.	28,050,000	279,915	41,613	80,431	30,888	1,045,585
31	Cottonseed oil	lb.	1,048,715,000	475,694	.....	466,178	.....	4,337,485
32	Corn oil	gal.	9,001,061	31,441	.....	31,005	.....	288,520
33	Cocoanut oil	lb.	1,110,000	503	.....	494	.....	4,591
34	Olive oil	lb.	1,300,000	590	.....	578	.....	5,377
	Sub-total—Oils and Nuts	.....	.....	788,143	41,613	578,686	30,888	5,681,558
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	44,718,207	2,605,757	922,989	19,060,829	97,458,818

* Less deductions as per text explanation of each item.

TABLE 7—*Continued*

Reference No.	Commodity	Original Units	1916–17 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	25,705,678	2,285,363	171,401	95,984	1,506,048	7,771,495
2	Hominy as corn	bu.	27,552,000	699,848	34,218	2,475	325,808	1,500,206
3	Wheat (nutrients in flour)	bu.	510,175,447	13,884,833	1,149,197	100,866	7,570,446	36,694,369
4	Oatmeal	lb.	598,992,840	271,701	44,015	19,563	183,126	1,114,127
5	Barley meal	lb.	8,181,000	3,711	394	82	2,702	13,417
6	Rye flour	bbl.	2,099,482	186,654	12,692	1,680	146,897	670,743
7	Buckwheat flour	lb.	105,438,000	47,826	3,061	574	37,208	170,810
8	Rice	lb.	914,563,000	414,843	33,188	830	327,724	1,491,652
	Sub-total—Grains	.....	.....	17,794,779	1,448,166	222,084	10,099,959	49,426,819
	Vegetables							
9	Beans	bu.	8,036,000	218,708	49,209	3,937	130,348	773,867
10	Peas (other than canned)	bu.	1,965,000	53,479	13,156	534	33,157	195,125
11	Potatoes	bu.	191,398,000	5,209,088	93,763	5,209	765,727	3,572,826
12	Sweet potatoes	bu.	47,327,000	1,180,714	16,530	7,084	258,595	1,197,373
13	Onions	bu.	5,875,000	151,898	2,089	447	13,282	67,192
14	Cabbage	short tons	168,291	152,672	2,137	305	7,328	42,073
15	Canned peas	cases (30 lb.)	6,686,000	90,983	3,275	182	8,916	51,148
16	Canned corn	cases (30 lb.)	9,130,000	124,241	3,479	1,491	23,666	124,625
17	Canned tomatoes	cases (51 lb.)	13,142,000	304,014	3,648	608	12,161	70,375
	Sub-total—Vegetables	.....	.....	7,485,797	187,286	19,797	1,253,120	6,094,604
	Saccharine Materials							
18	Beet sugar	short tons	820,657	744,492	.....	.....	744,492	3,052,844
19	Domestic cane sugar	short tons	311,700	282,771	.....	.....	268,633	1,101,548
20	Molasses	gal.	37,132,057	185,273	.....	.....	120,427	493,819
21	Glucose and grape sugar	lb.	1,152,000,000	522,544	.....	.....	444,160	1,821,312
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,000
23	Sorghum syrup	gal.	13,668,000	71,297	.....	.....	48,556	199,102
24	Maple sugar	lb.	12,100,000	5,489	.....	.....	4,544	18,634
25	Maple syrup	gal.	4,258,900	21,385	.....	.....	15,269	62,704
	Sub-total—Sugars	.....	.....	1,946,650	454	.....	1,738,161	7,129,963
	Fruits							
26	Apples	bbl.	45,485,000	2,970,989	8,913	8,913	320,865	1,440,965
27	Peaches	bu.	25,016,600	544,673	2,723	544	41,939	186,119
28	Pears	bu.	7,920,000	172,442	862	689	19,658	87,057
29	Oranges	boxes	19,546,400	602,901	2,411	603	46,423	203,361
29a	Prunes	short tons	77,500	70,307	1,266	0	43,731	184,450
29b	Raisins	short tons	125,000	113,399	2,608	3,402	77,678	361,250
29c	Apricots, dried	short tons	10,900	9,888	465	99	6,180	28,122
	Sub-total—Fruits	.....	.....	4,484,599	19,248	14,250	556,474	2,491,324
	Vegetable Oils and Nuts							
30	Peanuts	bu.	30,025,825	299,632	41,132	84,589	30,531	1,080,829
31	Cottonseed oil	lb.	1,201,386,000	544,945	.....	534,044	.....	4,968,932
32	Corn oil	gal.	9,146,542	31,928	.....	31,486	.....	292,991
33	Cocoanut oil	lb.	1,350,000	612	.....	600	.....	5,584
34	Olive oil	lb.	1,461,000	663	.....	650	.....	6,043
	Sub-total—Oils and Nuts	.....	.....	877,780	41,132	651,369	30,531	6,354,379
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	33,059,677	1,777,138	925,363	13,678,245	72,012,140

* Less deductions as per text explanation of each item.

TABLE 7—*Continued*

Reference No.	Commodity	Original units	1917–18 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Grains and Their Derivative Products							
1	Cornmeal (maize meal)	bbl.	33,216,495	2,953,112	221,482	124,030	1,946,093	10,042,210
2	Hominy as corn	bu.	27,896,000	708,586	34,646	2,506	329,876	1,518,937
3	Wheat (nutrients in flour)	bu.	485,635,000	13,216,945	1,115,065	97,805	7,345,070	35,601,416
4	Oatmeal	lb.	905,630,400	410,791	66,548	29,577	276,872	1,684,473
5	Barley meal	lb.	442,359,000	200,653	21,269	4,414	146,075	725,469
6	Rye flour	bbl.	4,912,600	436,755	29,700	3,931	343,724	1,569,477
7	Buckwheat flour	lb.	105,438,000	47,826	3,061	574	37,208	170,810
8	Rice	lb.	856,438,000	388,478	31,073	776	306,896	1,396,850
	Sub-total—Grains	.....	.....	18,363,146	1,522,849	263,613	10,731,814	52,709,642
	Vegetables							
9	Beans	bu.	11,776,000	320,496	72,111	5,769	191,013	1,134,029
10	Peas (other than canned)	bu.	2,171,250	59,092	14,537	591	36,637	215,605
11	Potatoes	bu.	295,172,000	8,033,401	144,600	8,033	1,180,897	5,509,976
12	Sweet potatoes	bu.	58,123,000	1,450,053	20,301	8,700	317,584	1,470,512
13	Onions	bu.	10,165,000	262,816	3,615	775	22,980	116,257
14	Cabbage	short tons	335,301	304,182	4,259	608	14,601	83,825
15	Canned peas	cases (30 lb.)	9,829,153	133,755	4,815	268	13,108	75,193
16	Canned corn	cases (30 lb.)	10,802,952	147,007	4,116	1,764	27,931	147,460
17	Canned tomatoes	cases (51 lb.)	15,076,074	348,755	4,185	698	13,951	80,732
	Sub-total—Vegetables	.....	.....	11,059,557	272,539	27,206	1,818,702	8,833,589
	Saccharine Materials							
18	Beet sugar	short tons	765,207	694,188	.....	.....	694,188	2,846,570
19	Domestic cane sugar	short tons	243,600	220,991	.....	.....	209,942	860,882
20	Molasses	gal.	38,336,952	191,255	.....	.....	124,315	509,763
21	Glucose and grape sugar	lb.	1,236,480,000	560,864	.....	.....	476,732	1,954,875
22	Honey	lb.	250,000,000	113,399	454	.....	92,080	380,600
23	Sorghum syrup	gal.	34,175,000	178,269	.....	.....	121,408	497,827
24	Maple sugar	lb.	10,838,000	4,916	.....	.....	4,071	16,691
25	Maple syrup	gal.	4,286,100	21,522	.....	.....	15,367	63,104
	Sub-total—Sugars	.....	.....	1,985,404	454	.....	1,738,103	7,129,712
	Fruits							
26	Apples	bbl.	38,821,000	2,535,710	7,607	7,607	273,855	1,229,849
27	Peaches	bu.	30,059,000	654,475	3,272	654	50,393	223,639
28	Pears	bu.	8,858,000	192,865	964	771	21,986	97,367
29	Oranges	boxes	10,265,600	316,638	1,266	317	24,381	106,803
29*a*	Prunes	short tons	110,000	99,791	1,796	0	62,070	261,800
29*b*	Raisins	short tons	160,000	145,150	3,338	4,355	99,128	462,400
29*c*	Apricots, dried	short tons	16,000	14,515	682	145	9,072	41,280
	Sub-total—Fruits	.....	.....	3,959,144	18,925	13,849	541,185	2,423,138
	Vegetable Oils and Nuts							
30	Peanuts	bu.	51,188,700	510,819	68,478	143,483	50,829	1,824,116
31	Cottonseed oil	lb.	1,149,291,000	521,315	.....	510,887	.....	4,753,468
32	Corn oil	gal.	9,280,023	32,415	.....	31,966	.....	297,462
33	Cocoanut oil	lb.	25,163,000	11,414	.....	11,186	.....	104,074
34	Olive oil	lb.	962,400	436	.....	428	.....	3,980
	Sub-total—Oils and Nuts	.....	.....	1,076,399	68,478	697,950	50,829	6,983,100
35	Fish	lb.	1,036,320,000	470,072	80,852	17,863	.....	515,051
	Grand Total—All Primary Foods	.....	.....	36,913,722	1,964,097	1,020,481	14,880,633	78,594,232

* Less deductions as per text explanation of each it em.

It is not proposed to enter upon any detailed discussion of the results shown in Table 7 until certain other data are in hand, because to do so would inevitably involve unnecessary duplication. Here it is desirable only to summarize in convenient form for reference the data of Table 7. This is done in Table 8.

TABLE 8.—SUMMARY OF PRODUCTION OF PRIMARY FOODS

(Metric Tons)

Year	Total of all primary foods as commodity	Protein in primary foods	Fat in primary foods	Carbohydrate in primary foods	Calories (millions) in primary foods
1911–12	32,284,633	1,721,083	943,820	13,112,496	69,634,613
1912–13	37,974,989	2,003,254	922,136	14,957,522	78,152,802
1913–14	35,831,949	2,034,950	948,495	15,126,422	79,218,759
1914–15	42,354,173	2,327,578	1,092,610	17,063,873	89,706,981
1915–16	44,718,207	2,605,757	922,989	19,060,829	97,458,818
1916–17	33,059,677	1,777,138	925,363	13,678,245	72,012,140
1917–18	36,913,722	1,964,097	1,020,481	14,880,633	78,594,232
Total for 7 years	263,137,350	14,434,457	6,775,894	107,880,020	564,778,345
Average per year, whole period	37,591,050	2,062,065	967,985	15,411,431	80,682,621
Average per year, 3 prewar years	35,363,857	1,919,962	938,150	14,398,813	75,668,725
Average, war years	39,261,445	2,168,643	990,361	16,170,895	84,443,043
Per cent. nutrients to total (whole period) and calories per pound	.....	5.5	2.6	41.0	97.4

The data of Table 8 are shown graphically in Fig. 3.

From the summary and Fig. 3 we note: first of all, that while the total production of primary foods generally increased up to the year 1915–16 it fell off badly in the two following years, 1916–17 and 1917–18, going back in 1916–17 to practically the level of the earliest of the prewar years here discussed. The yearly fluctuations are, however, much less violent in the nutrients than in the gross totals of commodities. This can best be demonstrated by reducing the figures of Table 8 to a relative basis, by taking the average of the whole period as 100, for each column, and then reducing each year figure to that relative base. This is done in Table 9.

The much smoother increase in the nutrients to the high point in 1915–16, as compared with the gross commodity total is apparent.

Protein shows the greatest percentage change, the production having increased 42 per cent. from 1911–12 to 1915–16. It also

FIG. 3.—Showing the course of production of primary food materials since 1911. Solid line denotes total primary food production. Dash line, protein content of primary foods, dot line, fat content of primary foods, dash-dot line, carbohydrate content of primary foods.

TABLE 9.—RELATIVE CHANGES IN PRODUCTION OF PRIMARY FOODS
(Seven Year Average = 100)

Year	All primary foods as commodity	Protein in primary foods	Fat in primary foods	Carbohydrate in primary foods	Calories in primary foods
1911–12	86	83	98	85	86
1912–13	101	97	95	97	97
1913–14	95	99	98	98	98
1914–15	113	113	113	111	111
1915–16	119	126	95	124	121
1916–17	88	86	96	89	89
1917–18	98	95	105	96	97

suffered most in the slump of 1916–17, dropping back 40 per cent. in one year from its highest point. The increase in calories amounts to 35 per cent. The greatest increase in fat production was from 1912–13 to 1914–15, amounting to 18 per cent., less than half of the increase in protein production. One might think that all the nutrients ought to change proportionately to each other and to the total crop. Thus it may puzzle one at first thought to understand why the nutrient production was higher for all three in 1913–14 than in 1912–13, while the total production of primary foods as commodity was 6 per cent. lower in 1913–14 than in 1912–13. The explanation for the apparent paradox is seen to be simple by examination of the separate items in Table 7. In 1913–14 the vegetables and fruits gave generally a lower production than in the previous year. But the grains were higher, and also the sugars and fats. Thus, while the decrease in the fruits and vegetables was sufficient to bring about a decrease in gross tonnage, the higher nutrient content of grains, fats, and sugars turned the nutrient scale the other way.

The year 1917–18 was below the general average of the whole period in all items of primary nutrient production except fat. The stimulation of high prices to the producer and great demand for vegetable oils, and the response of the people of the country to the request of the Food Administration to eat more cornmeal resulted in a notable increase in the net production of nutrient fat in the form of primary foods during the past year. The result is of great significance as indicating the possibilities of fat production from vegetable sources in this country under stress of necessity. To go into the matter a little more closely, it is seen that the total production of primary foods in 1917–18 was 1,113,974 metric tons *lower* than in 1912–13, a decrease of approximately 3 per cent. But in 1917–18 the net nutrient fat produced in the primary foods for human food uses was 113,274 metric tons *higher* than that produced in 1912–13. It thus appears in comparing these two years that with a 3 per cent. *smaller* total primary food production, there was a 12 per cent. *greater* production of net nutrient fat from the primary foods. Even this certainly does not represent the extent to which we might go, in dire necessity, in speeding up and extending the manufacturing processes which make available for human food the fat content of the primary crops.

With a single exception, 1917–18 shows the highest production of fat. The exception is 1914–15, when the cottonseed oil production was very high owing to a bumper cotton crop and brought up the total.

The last line of Table 8 is of interest in showing the net percentage nutrient content of all primary foods over the whole seven year period. From this line it is seen that, after making all due deductions for seed, invisible loss, etc., the net percentage of protein in the primary foods was 5.5, of fat 2.6 and of carbohydrate 41.4, with a fuel value of 985 calories to the pound. It should be understood that these percentages are *net*. Besides the general deductions from the commodities as explained above, allowance was made in calculating the nutrients for inedible refuse in preparing the foods for the table. Putting all the nutrients together it appears that of the net tonnage of primary food commodities produced in this country for human consumption only 49.5 per cent. has direct true nutrient value. The remaining 50.5 per cent. represents (*a*) water, (*b*) inedible refuse, and (*c*) ash.

The relation of the different primary food commodities to the total production of nutrients will be discussed in a later chapter.

CHAPTER IV

THE SECONDARY FOOD PRODUCTION OF THE UNITED STATES

(Commodity References Nos. 36–48)

In this chapter will be considered the production of the remaining materials used as human food in addition to the primary foods listed in Chapter III. Here again there are of necessity minor omissions, and in some cases we have had to resort to estimates because of lack of statistics. No account is taken of the production of meats through game, goats, rabbits or horses. None of these items is of any statistical significance in the nutrition of this nation, though in certain foreign countries each of them assumes some importance. Here it would be impossible to include these items in any case because of lack of information.

Just as in Chapter III it will be necessary to give a detailed explanation of how the figures on each item were obtained. The reference numbers to items will continue serially from those in Chapter III.

In Table 11 are given data as to the domestic production of the following commodities:

MEATS AND DERIVATIVE PRODUCTS

36. Beef.—The data here include the total production of what is technically known as carcass beef. This means the meat and fat of the dressed carcass. This item does not include (*a*) the visceral fat, from which oleo oil is made and which is accounted separately for in the oleomargarine and in the oleo oil produced for export, or (*b*) the edible offal, liver, tongue, etc.

To arrive at total production the starting point was the statistics of slaughter of cattle under federal inspection, published by the Bureau of Animal Industry of the U. S. Department of Agriculture. It was assumed that the percentage of inspected slaughter to the total slaughter in the whole country was the same as that found at the last census (56.39 per cent.) for all years up to 1916–17. It is known that during the past two years there has been a marked

change in this percentage. After careful consideration the following estimates were made:

Year	Percentage of inspected slaughter to total
1916–17	63
1917–18	72

The number of animals slaughtered, as above calculated, was then multiplied by the average live weight per animal for the same year, as determined at the Chicago packing establishments.[1] This gave the total live weight slaughtered. There may be some criticism of using Chicago average live weights rather than those from some other point or points but, on the whole, it seemed wisest to use the Chicago figures for the reason that it is the largest market and, over a period of years such as we are here dealing with, probably the most representative. Having arrived at total live weight figures 52.5 per cent. of these was taken as representing dressed weight.

In obtaining the nutritive values Atwater and Bryant's (p. 28) figures for "Sides, All analyses" were used, taking the "As purchased" values, which as already explained (p. 33) make allowance for inedible refuse as a part of the analysis.

37. **Edible Offal from Cattle.**— In obtaining the edible offal figures 2.9 per cent. of the live weight as given under Reference No. 36 was taken to represent the production of these products. This percentage figure was calculated from data reported by the packers.

To obtain the nutritive value of the edible offal Atwater and Bryant's figures for the following organs were averaged: brain, heart, kidneys, lungs, marrow, sweetbreads, suet and tongue. In making the average each organ was allowed to count roughly in proportion to its weight. The final weighted average analysis of beef offal "as purchased" was as follows:

Protein	16.0 per cent.
Fat	14.9 per cent.
Carbohydrate	1.0 per cent.
Calories	945 per lb.

The carbohydrate is, of course, glycogen in the livers.

[1] I wish to acknowledge my great indebtedness to the various Chicago packers, particularly Armour & Co., for furnishing much needed data on various points connected with this analysis of meat production. For many points no official statistics are either collected or published, and the books of the packers are the only source of information.

38. Veal.—In principle the method of arriving at production figures for veal was the same as that used for beef. Starting with inspected slaughter the census percentage of 33.46 per cent. inspected to total slaughter was applied for all years up to 1916–17. For 1916–17 a percentage of 45 was assumed, and for 1917–18 a percentage of 50. The number of animals slaughtered, as above determined, was multiplied by the average Chicago live weight for each year. The percentage of dressed weight to live weight was taken at 62.11 per cent. The analytical figures for sides as purchased were used.

39. Edible Offal from Calves.—The edible offal for calves was taken at 5.23 per cent. of the live weight on the basis of packers' reports. The nutritive values of the offal were computed on the same plan as that employed for beef edible offal, with the following weighted average analytical results:

Protein	17.3 per cent.
Fat	6.1 per cent.
Carbohydrate	0.0 per cent.
Calories	576 per lb.

40. Pork and Lard.—Here the percentage of inspected to total slaughter is taken for all years at 58.86 per cent. there being no evidence of any significant change in this respect in recent years. The average percentage of dressed weight to live weight is taken at 71.97 per cent. for all years, on the basis of packers' reports. This dressed weight percentage *includes the lard* produced from the carcass, along with the pork, so that lard is not set down as a separate item in Table 11. The analytical figures used were those for "Side, lard and other fat included as purchased" (Atwater & Bryant, p. 39).

41. Edible Offal from Hogs.—Packers' reports indicate the edible offal to be 5.559 per cent. of the live weight. This figure was accordingly used. For the analytical constants we have again made a weighted average of the organs included, with the following results:

Protein	18.4 per cent.
Fat	8.8 per cent.
Carbohydrate	0.8 per cent.
Calories	732 per lb.

42. Mutton and Lamb.- Here the percentage of inspected to total slaughter is taken at 76.95 for all years. On account of the inclusion here in one group of old and young animals it was thought desirable to get the dressed weight in a different manner than in the other cases. Through the kindness of Armour & Co., we were able to get average absolute dressed weights from all their plants and these absolute weights were applied to total slaughter. The analytical figures used were for sides as purchased, including tallow.

43. Edible Offal from Sheep and Lambs.—The percentage of edible offal here, from packers' reports, is 2.77 per cent. of the live weight. The weighted average analytical constants used are:

Protein	19.8 per cent.
Fat	8.9 per cent.
Carbohydrate	2.8 per cent.
Calories	796 per lb.

44. Oleomargarine.—The statistics on the production of oleomargarine were obtained from the "Annual Report of the Commissioner of Internal Revenue for the Fiscal Year Ending June 30, 1917" (p. 150) for all years up to 1917–18. The production for 1917–18 was estimated on the basis of monthly returns from the Commissioner of Internal Revenue through April, 1918.

As already explained (p. 43 *supra*) this item involves some nutritional duplication, in respect of the vegetable oils which oleomargarine contains. This duplication is allowed to stand in order to correct in the total for the omission of minor vegetable oils from the primary foods.

45. Oleo Oil for Export.—This item is inserted here as well as in the export table on the following reasoning. Oleo oil is made from the visceral and caul fat of beef, which is not included in the dressed weight of beef in Table 11. That portion of the oleo oil which is domestically consumed is used in making oleomargarine and its production is accounted for in Item 44 above. But if we did not insert here the oleo oil which is exported as such, we should be short on the production side of the ledger by just that amount. It is not an insignificant item, and therefore it has been inserted here. The data are from the successive numbers of the Monthly Summary of Foreign Commerce issued by the Department of Commerce. The same item appears unchanged in Table 37, Chapter VII, among other exports.

POULTRY AND EGGS

46. Poultry.—Unfortunately there are no annual statistics as to either amount of poultry on farms, or production of poultry. Consequently we have had to estimate this item. This has been done after consultation with the Animal Husbandry Division of the Department of Agriculture. The best that can be done is an estimate of the annual production of all sorts of poultry. The values given are arrived at partly from Census figures and partly from an assumed annual increase, accompanying the increasing population of the country and the steady and intensive propaganda on the part of the Department of Agriculture, the Agricultural Experiment Stations, and the Colleges of Agriculture for more and better poultry.

An average live weight of 3 lb. per head is assumed. This seems reasonable when it is remembered that the total includes everything from turkeys and geese to broiler chicks.

Because of the heterogeneous inclusiveness of the item the question of proper analytical factors is a difficult one. It has been approached from the general angle of weighting the analyses of Atwater and Bryant for the different sorts of poultry, broiler chicks, fowls, turkeys, etc. in roughly the proportion that the specified kind of poultry is marketed, and then taking a weighted average analysis to apply to the lump production figure. In determining the weighting factors the writer has ventured to allow himself to estimate them on the basis of his own fairly long and intimate acquaintance with the poultry industry in this country. The refuse percentage in preparing poultry for the table is large—from 20 to 40 per cent. in Atwater and Bryant's computation. This explains in part why the total contribution to the nutrition of the nation by poultry is so comparatively small.

The weighted mean analysis used in calculating nutrients is as follows:

Protein	13.3 per cent.
Fat	9.3 per cent.
Calories	639 per lb.

47. Eggs.—Again annual statistics are lacking, and an estimate has to be made on the basis of Census returns. In 1909 the Census estimated the number of eggs produced in the year at 1,591,311,371

dozen. The Animal Husbandry Division of the Department of Agriculture is of the opinion, with which the writer agrees, that owing to better methods of husbandry the productivity per fowl has been rising somewhat since 1909. They suggest that in recent years an annual production of 1,875,000,000 dozen probably represents the facts. The production in 1917–18 was unquestionably lower than in the previous year, due to high prices for feed on the one hand, and for poultry on the other hand. On the basis of the above consideration I have estimated annual production figures as shown in Table 11. The average weight of eggs was taken at 1.5 lb. per dozen.

DAIRY PRODUCTS

48. Dairy Products (as Milk).—Under this rubric are included all the dairy products, milk, butter, cheese, etc. It is possible to get a much more accurate result by handling the matter in this way than would be the case if one attempted to separate the several items. All are expressed in terms of milk.

To obtain the production of milk it is assumed that each cow, as enumerated each year under the rubric "Dairy Cows" by the Bureau of Crop Estimates of the Department of Agriculture, produces on the average 154 lb. of butter fat in the year. This estimate is one which is agreed to by the Dairy Division of the Department of Agriculture and is probably very close to the truth. Multiplying this average annual production by the number of dairy cows gives the total production of butter fat. It is next assumed that the milk will average to test 3.6 per cent. fat. This estimate may be a little high, but it cannot be far from the fact. This leads to an average milk production per cow of 4278 lb. per year.

As to the nutritional distribution of the product it is assumed that 96 per cent. of the fat content of the milk, and 50 per cent. each of the protein and carbohydrate content go to human food uses. Of the remainder it is assumed that 3 per cent. of the total fat and 40 per cent. each of the total protein and carbohydrate contents go to animal feed; in the form of skim milk, butter milk, and milk sucked by calves. The residue (1 per cent. of the total fat content, and 10 per cent. each of protein and carbohydrate contents) is assumed to be lost, wasted, and used for non-food industrial purposes.

The conversion factors, by which commodities in units given are

converted to short tons of protein, fat and carbohydrate, are given in Table 10. Values in short tons obtained by the application of these factors are converted to metric tons by multiplying by 0.9072.

TABLE 10.—FACTORS BY WHICH QUANTITIES (IN SPECIFIED ORIGINAL UNIT OF MEASURE) OF THE COMMODITIES NAMED ARE TO BE MULTIPLIED TO GET THE CONTAINED AMOUNT OF PROTEIN, FAT AND CARBOHYDRATE IN SHORT TONS OF 2000 LB. TO CONVERT TO METRIC TONS MULTIPLY EITHER THE RESULT IN SHORT TONS, OR THE FACTORS IN THIS TABLE, BY 0.9072

Reference No.	Commodity	Original specified unit of measure	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
36	Beef	lb.	0.000076	0.000077	0	0.000935
37	Edible offal from cattle	lb.	0.000080	0.000074	0.000005	0.000945
38	Veal	lb.	0.000078	0.000031	0	0.000555
39	Edible offal from calves	lb.	0.000087	0.000031	0	0.000576
40	Pork and lard	lb.	0.000041	0.000274	0	0.002465
41	Edible offal from hogs	lb.	0.000092	0.000044	0.000004	0.000945
42	Mutton and lamb	lb.	0.000065	0.000120	0	0.001255
43	Edible offal from sheep	lb.	0.000099	0.000044	0.000014	0.000796
44	Oleomargarine	lb.	0.000006	0.000415	0	0.003525
45	Oleo oil for export	lb.	0	0.000500	0	0.004220
46	Poultry	lb.	0.000067	0.000046	0	0.000639
47	Eggs	doz.	0.000098	0.000070	0	0.000953
48	Dairy products	lb.	0.000009	0.000017	0.000011	0.000218

In Table 11 are given the data as to the production of secondary foods in the United States. The arrangement of the table is the same as that of Table 7 for the production of primary foods.

TABLE 11.—SHOWING THE SECONDARY FOOD PRODUCTION OF THE UNITED STATES FROM 1911–12 TO 1917–18, INCLUSIVE

Reference No.	Commodity	Original units	1911–12 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	6,887,618,107	3,124,203	474,877	481,125	0	6,439,923
37	Edible offal from cattle	lb.	380,458,888	172,575	27,612	25,541	1,725	359,534
38	Veal	lb.	619,670,929	281,081	43,848	17,427	0	343,917
39	Edible offal from calves	lb.	51,771,226	23,483	4,039	1,409	0	29,820
40	Pork and lard	lb.	9,451,496,000	4,287,170	351,546	2,349,359	0	23,297,938
41	Edible offal from hogs	lb.	734,109,000	332,990	61,270	29,303	2,664	537,368
42	Mutton and lamb	lb.	716,788,045	325,133	42,267	78,032	0	899,569
43	Edible offal from sheep and lambs	lb.	41,011,650	18,603	3,683	1,637	521	32,645
44	Oleomargarine	lb.	128,601,053	58,333	700	48,416	0	453,319
45	Oleo oil for export	lb.	126,467,124	57,365	0	57,365	0	533,691
	Sub-total—Meats	...	.....	8,680,936	1,009,842	3,089,614	4,910	32,927,724
	Poultry and Eggs							
46	Poultry	lb.	1,455,000,000	659,984	88,437	60,718	0	929,745
47	Eggs	doz.	1,671,000,000	1,136,940	148,560	106,114	0	1,592,463
	Sub-total—Poultry	...	.....	1,796,924	236,997	166,832	0	2,522,208
	Dairy Products							
48	Dairy products (as milk)	lb.	88,550,322,000	40,166,160	722,988	1,365,643	883,652	19,303,970
	Grand Total—All Secondary Foods	...	.....	50,644,020	1,969,827	4,622,089	888,562	54,753,902

* Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1912–13 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	6,583,363,871	2,986,194	453,900	459,872	0	6,155,445
37	Edible offal from cattle	lb.	363,652,460	164,952	26,392	24,412	1,649	343,652
38	Veal	lb.	559,183,116	253,644	39,568	15,726	0	310,347
39	Edible offal from calves	lb.	46,717,692	21,191	3,645	1,272	0	26,909
40	Pork and lard	lb.	9,217,655,000	4,181,101	342,849	2,291,233	0	22,721,520
41	Edible offal from hogs	lb.	715,791,450	324,681	59,741	28,572	2,597	523,959
42	Mutton and lamb	lb.	763,667,143	346,397	45,031	83,135	0	958,402
43	Edible offal from sheep and lambs	lb.	42,734,507	19,384	3,838	1,706	542	34,017
44	Oleomargarine	lb.	145,227,862	65,875	790	54,676	0	511,928
45	Oleo oil for export	lb.	92,849,757	42,116	0	42,116	0	391,826
	Sub-total—Meats	...	.....	8,405,535	975,754	3,002,720	4,788	31,978,005
	Poultry and Eggs							
46	Poultry	lb.	1,467,000,000	665,427	89,167	61,219	0	937,413
47	Eggs	doz.	1,711,000,000	1,164,156	152,116	108,654	0	1,630,583
	Sub-total—Poultry	...	.....	1,829,583	241,283	169,873	0	2,567,996
	Dairy Products							
48	Dairy products (as milk)	lb.	87,686,166,000	39,774,182	715,932	1,352,316	875,028	19,115,584
	Grand Total—All Secondary Foods	...	.....	50,009,300	1,932,969	4,524,909	879,816	53,661,585

* Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1913–14 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	6,316,536,258	2,865,162	435,503	441,233	0	5,905,961
37	Edible offal from cattle	lb.	348,913,413	158,266	25,322	23,424	1,583	329,723
38	Veal	lb.	473,500,760	214,779	33,505	13,317	0	262,793
39	Edible offal from calves	lb.	39,559,238	17,944	3,086	1,077	0	22,786
40	Pork and lard	lb.	8,808,943,000	3,995,710	327,647	2,189,639	0	21,714,044
41	Edible offal from hogs	lb.	684,123,930	310,317	57,098	27,307	2,482	500,779
42	Mutton and lamb	lb.	753,377,467	341,730	44,425	82,014	0	945,489
43	Edible offal from sheep and lambs	lb.	42,158,679	19,123	3,787	1,683	535	33,558
44	Oleomargarine	lb.	144,021,276	65,328	784	54,222	0	507,675
45	Oleo oil for export	lb.	97,017,065	44,007	0	44,007	0	409,412
	Sub-total—Meats	...	.....	8,032,366	931,157	2,877,923	4,600	30,632,220
	Poultry and Eggs							
46	Poultry	lb.	1,479,000,000	670,870	89,896	61,720	0	945,081
47	Eggs	doz.	1,752,000,000	1,192,052	155,761	111,258	0	1,669,656
	Sub-total—Poultry	...	.....	1,862,922	245,657	172,978	0	2,614,737
	Dairy Products							
48	Dairy products (as milk)	lb.	88,712,886,000	40,239,899	724,315	1,368,150	885,274	19,339,409
	Grand Total—All Secondary Foods	...	.....	50,135,187	1,901,129	4,419,051	889,874	52,586,366

* Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1914–15 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	6,634,677,630	3,009,470	457,437	463,456	0	6,203,424
37	Edible offal from cattle	lb.	366,486,949	166,237	26,598	24,603	1,662	346,330
38	Veal	lb.	444,592,696	201,666	31,460	12,503	0	246,749
39	Edible offal from calves	lb.	37,144,092	16,843	2,898	1,011	0	21,395
40	Pork and lard	lb.	10,192,035,000	4,623,076	379,090	2,533,435	0	25,123,366
41	Edible offal from hogs	lb.	791,638,070	359,085	66,072	31,599	2,873	579,479
42	Mutton and lamb	lb.	649,592,567	294,653	38,305	70,716	0	815,239
43	Edible offal from sheep and lambs	lb.	36,350,932	16,489	3,265	1,451	462	28,935
44	Oleomargarine	lb.	145,810,048	66,139	794	54,895	0	513,980
45	Oleo oil for export	lb.	80,481,946	36,506	0	36,506	0	339,634
	Sub-total—Meats	...	.....	8,790,169	1,005,919	3,230,175	4,997	34,218,531
	Poultry and Eggs							
46	Poultry	lb.	1,491,000,000	676,313	90,626	62,221	0	952,749
47	Eggs	doz.	1,793,000,000	1,219,948	159,406	113,861	0	1,708,729
	Sub-total—Poultry	...	.....	1,896,261	250,032	176,082	0	2,661,478
	Dairy Products							
48	Dairy products (as milk)	lb.	90,958,836,000	41,258,655	742,653	1,402,788	907,686	19,829,026
	Grand Total—All Secondary Foods	...	.....	51,945,085	1,998,604	4,809,045	912,683	56,709,035

*Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1915–16 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	6,944,361,254	3,149,941	478,788	485,089	0	6,492,978
37	Edible offal from cattle	lb.	383,593,266	173,997	27,839	25,751	1,740	362,496
38	Veal	lb.	510,076,031	281,369	36,093	14,344	0	283,092
39	Edible offal from calves	lb.	42,614,976	19,330	3,325	1,159	0	24,546
40	Pork and lard	lb.	10,392,366,000	4,713,946	386,542	2,583,231	0	25,617,182
41	Edible offal from hogs	lb.	807,198,060	366,143	67,370	32,221	2,929	590,869
42	Mutton and lamb	lb.	617,234,024	279,975	36,396	67,194	0	774,629
43	Edible offal from sheep and lambs	lb.	34,540,155	15,667	3,102	1,379	439	27,494
44	Oleomargarine	lb.	152,509,913	69,178	830	57,418	0	537,597
45	Oleo oil for export	lb.	102,645,914	46,560	0	46,560	0	433,166
	Sub-total—Meats	...	.....	9,066,106	1,040,285	3,314,346	5,108	35,144,049
	Poultry and Eggs							
46	Poultry	lb.	1,500,000,000	680,395	91,173	62,596	0	958,500
47	Eggs	doz.	1,834,000,000	1,247,844	163,051	116,465	0	1,747,802
	Sub-total—Poultry	...	.....	1,928,239	254,224	179,061	0	2,706,302
	Dairy Products							
48	Dairy products (as milk)	lb.	94,578,024,000	42,900,308	772,202	1,458,604	943,802	20,618,009
	Grand Total—All Secondary Foods	...	.....	53,894,653	2,066,711	4,952,011	948,910	58,468,360

* Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1916–17 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	7,504,745,792	3,404,130	517,426	524,233	0	7,016,937
37	Edible offal from cattle	lb.	414,547,862	188,038	30,086	27,830	1,881	391,748
38	Veal	lb.	507,256,600	230,090	35,894	14,266	0	281,527
39	Edible offal from calves	lb.	42,379,432	19,223	3,307	1,153	0	24,411
40	Pork and lard	lb.	10,272,227,000	4,659,451	382,073	2,553,368	0	25,321,040
41	Edible offal from hogs	lb.	797,866,670	361,910	66,591	31,848	2,895	584,038
42	Mutton and lamb	lb.	570,515,570	258,784	33,642	62,108	0	715,997
43	Edible offal from sheep and lambs	lb.	31,976,181	14,504	2,872	1,276	406	25,453
44	Oleomargarine	lb.	233,179,111	105,765	1,269	87,785	0	821,925
45	Oleo oil for export	lb.	67,113,421	30,442	0	30,442	0	283,219
	Sub-total—Meats	...	.....	9,272,337	1,073,160	3,334,309	5,182	35,466,295
	Poultry and Eggs							
46	Poultry	lb.	1,485,000,000	673,592	90,261	61,970	0	948,915
47	Eggs	doz.	1,875,000,000	1,275,741	166,696	119,069	0	1,786,875
	Sub-total—Poultry	...	.....	1,949,333	256,957	181,039	0	2,735,790
	Dairy Products							
48	Dairy products (as milk)	lb.	97,940,532,000	44,425,531	739,656	1,510,461	977,358	21,351,036
	Grand Total—All Secondary Foods	...	.....	55,647,201	2,129,773	5,025,809	982,540	59,553,121

* Excluding deductions as per text.

TABLE 11—*Continued*

Reference No.	Commodity	Original units	1917–18 Production* in original units	Production* in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories (millions)
	Meats and Derivative Products							
36	Beef	lb.	7,395,267,011	3,354,471	509,877	516,587	0	6,914,575
37	Edible offal from cattle	lb.	408,500,463	185,295	29,647	27,423	1,853	386,033
38	Veal	lb.	614,442,700	278,709	43,479	17,280	0	341,016
39	Edible offal from calves	lb.	51,334,426	23,285	4,005	1,397	0	29,569
40	Pork and lard	lb.	10,146,043,000	4,602,215	377,380	2,522,003	0	25,009,996
41	Edible offal from hogs	lb.	788,055,840	357,460	65,772	31,456	2,859	576,857
42	Mutton and lamb	lb.	442,290,091	200,621	26,081	48,149	0	555,074
43	Edible offal from sheep and lambs	lb.	24,750,373	11,227	2,223	988	315	19,701
44	Oleomargarine	lb.	338,487,893	153,537	1,843	127,435	0	1,193,170
45	Oleo oil for export	lb.	56,648,102	25,695	0	25,695	0	239,055
	Sub-total—Meats	...	.....	9,192,515	1,060,307	3,318,413	5,027	35,265,046
	Poultry and Eggs		1,470,000,000	666,788	89,349	61,344	0	939,330
46	Poultry	lb.	1,800,000,000	1,224,711	160,028	114,306	0	1,715,400
47	Eggs	doz.						
	Sub-total—Poultry	...	.....	1,891,499	249,377	175,650	0	2,654,730
	Dairy Products							
48	Dairy products (as milk)	lb.	99,608,952,000	45,182,322	813,279	1,536,192	994,006	21,714,752
	Grand Total—All Secondary Foods	...	.....	56,266,336	2,122,963	5,030,255	999,033	59,634,528

*Excluding deductions as per text.

Since at this point we are concerned only with the presentation of basic data, detailed discussion of the results set forth in Table 11 will be deferred to a later chapter. Before passing to the next phase of the subject, however, it is of interest to compare the total secondary food production in the successive years covered. This is done in Table 12 and in Fig. 4.

TABLE 12.—SUMMARY OF PRODUCTION OF SECONDARY FOODS

(Metric Ton)

Year	Total of all secondary foods as commodity	Protein in secondary foods	Fat in secondary foods	Carbohydrate in secondary foods	Calories (millions) in secondary foods
1911–12	50,644,020	1,969,827	4,622,089	888,562	54,753,902
1912–13	50,009,300	1,932,969	4,524,909	879,816	53,661,585
1913–14	50,135,187	1,901,129	4,419,051	889,874	52,586,366
1914–15	51,945,085	1,998,604	4,809,045	912,683	56,709,035
1915–16	53,894,653	2,066,711	4,952,011	948,910	58,468,360
1916–17	55,647,201	2,129,773	5,025,809	982,540	59,553,121
1917–18	56,266,336	2,122,963	5,030,255	999,033	59,634,528
Total for 7 years	368,541,782	14,121,976	33,383,169	6,501,418	395,366,897
Average per year, whole period	52,648,826	2,017,425	4,769,024	928,774	56,480,985
Average per year, 3 prewar years	50,262,836	1,934,642	4,522,016	886,084	53,667,284
Per cent. nutrients to total (whole period) and calories per lb.	.....	3.8	9.1	1.8	487

The data of Table 12 are shown graphically in Fig. 4. They are reduced in Table 13 to relative figures by taking the average of the whole period for each column as 100 and reducing each year to that base.

TABLE 13.—RELATIVE CHANGES IN PRODUCTION OF SECONDARY FOODS

(Seven Year Average = 100)

Year	All secondary foods as commodity	Protein in secondary foods	Fat in secondary foods	Carbohydrate in secondary foods	Calories in secondary foods
1911–12	96	98	97	96	97
1912–13	95	96	95	95	95
1913–14	95	94	93	96	93
1914–15	99	99	101	98	100
1915–16	102	102	104	102	104
1916–17	106	106	105	106	105
1917–18	107	105	105	108	106

It is evident that the production of secondary foods is a more stable matter than the production of primary foods. The maximum fluctuation in the relative figures of Table 13 amounts to only 12 or 13 points in any nutrient or the total production. This would, on the whole, be expected because of the fact that animal produc-

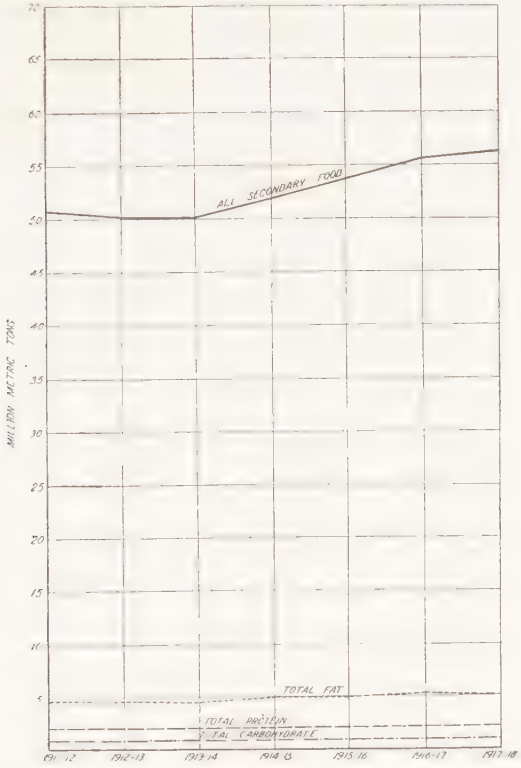

FIG. 4.—Showing the course of production of secondary food materials since 1911. Solid line denotes total secondary food production; dash line, protein content of secondary foods; dot line, fat content of secondary foods; dash-dot line, carbohydrate content of secondary foods.

tion operates from a base which is much more nearly perennial than crop production and is also less influenced by small environmental changes. The growth and production of a herd of cattle or hogs is less affected by unfavorable weather conditions in a particular season than is a crop of wheat, for example.

A second point which strikes one at once in comparing secondary

with primary food production is that, during the period of time here under discussion, the maximum productivity is attained in different years in the two cases. The maximum of gross production of secondary foods is reached in the last year of the period, 1917–18. The same is also true of all the separate nutrients except protein, which falls in 1917–18 a little behind the 1916–17 production. The maximum primary production was, as we have seen earlier, in 1915–16.

The last line of Table 12 shows that of the 368,541,782 metric tons of secondary foods produced in the seven years, which amount is the residue after all necessary deductions, 3.8 per cent. net was protein available for human nutrition, 9.1 per cent. fat and 1.8 per cent. carbohydrate. Or, put it another way, all the net nutrients in secondary foods, after allowing for inedible refuse, amount to but 14.7 per cent. of the total net tonnage of such foods. The remaining 85.3 per cent. represents (*a*) water, (*b*) inedible refuse and (*c*) ash. These figures, in comparison with the similar ones for primary foods given in the preceding chapter, show at once how different in a physiological sense the secondary foods are from the primary. The great outstanding function of the secondary foods is to supply fat in a form relished by human beings. Further of course these foods play an important rôle in supplying body building protein and vitamines.

CHAPTER V

TOTAL HUMAN FOOD PRODUCTION

Having now completed the survey of the production of primary and secondary food materials separately, it is desirable to combine the two and put the material in such form as to make possible certain general conclusions regarding the total production of human food in this country. At the outstart it needs to be again made clear exactly what the figures signify. As explained in the text of Chapters III and IV, in detail, the total production in metric tons means, in case of each commodity, the net production of that commodity *available for human food*, after deductions for seed, spoilage, animal feeding, industrial uses, etc. The nutrient production figures show, for each commodity, the net amount of protein, carbohydrate, fat, and calories, which can be got as human nutrients out of the total produced, after allowing for the inedible refuse which was still included in the total commodity production figures, even after the general deductions described above had been made.

It will be of interest to consider first the results in the mass. Table 14, which is a combination of Tables 8 and 12, shows the total production of human food in each year covered in this study and the percentage contribution of primary and secondary foods to this total.

The total production of human food within the period under consideration increased rather steadily to a maximum point in 1915–16 and then fell off in the last two years. The same course was true of protein, carbohydrate and calories. The fat production followed a different line, reaching a maximum in 1917–18.

Comparing the four war years with the three prewar years, it is seen that the average annual production had been definitely greater in the war period. The absolute and percentage amounts of the increase are shown in Table 15.

TABLE 14.—TOTAL HUMAN FOOD PRODUCTION IN THE UNITED STATES

(Metric Tons)

Year	Total of all foods as commodity	Per cent. from		Total protein	Per cent from		Total fat	Per cent. from		Total carbohydrate	Per cent. from		Total calories (millions)	Per cent. from	
		Primary	Secondary		Primary	Secondary		Primary	Secondary		Primary	Secondary		Primary	Secondary
1911–12	82,928,653	39	61	3,691,510	47	53	5,565,909	17	83	14,001,058	94	6	124,388,515	56	44
1912–13	87,984,289	43	57	3,936,223	51	49	5,447,045	17	83	15,837,338	94	6	131,814,387	59	41
1913–14	85,967,136	42	58	3,936,079	52	48	5,367,546	18	82	16,016,296	94	6	131,805,125	60	40
1914–15	94,299,258	45	55	4,326,182	54	46	5,901,655	19	81	17,976,556	95	5	146,416,016	61	39
1915–16	98,612,860	45	55	4,672,468	56	44	5,875,000	16	84	20,009,739	95	5	155,927,178	63	37
1916–17	88,706,878	37	63	3,906,911	45	55	5,951,172	16	84	14,660,785	93	7	131,565,261	55	45
1917–18	93,180,058	40	60	4,087,060	48	52	6,050,736	17	83	15,879,666	94	6	138,228,760	57	43
Total for 7 years	631,679,132	42	58	28,556,433	51	49	40,159,063	17	83	114,381,438	94	6	960,145,242	59	41
Annual average whole period	90,239,876	42	58	4,079,490	51	49	5,737,009	17	83	16,340,205	94	6	137,163,606	59	41
Annual average 3 prewar years	85,626,693	41	59	3,854,604	50	50	5,460,167	17	83	15,284,897	94	6	129,336,009	59	41
Annual average war period	93,699,763	42	58	4,248,155	51	49	5,944,641	17	83	17,131,687	94	6	143,034,304	59	41
Average per year, 1914–15 to 1916–17	93,872,999			4,301,854			5,909,276			17,549,027			144,636,152		
Per cent. of nutrients to total (whole period) and calories per lb.				4.5			6.4			18.1			689		

TABLE 15.—EXCESS OF AVERAGE ANNUAL HUMAN FOOD PRODUCTION DURING WAR PERIOD

Item	Excess of annual average war production over prewar	Per cent. increase
Total human food	8,073,070 metric tons	+ 9.43
Protein	393,551 metric tons	+10.21
Fat	484,474 metric tons	+ 8.87
Carbohydrate	1,846,990 metric tons	+12.08
Calories	13,698,295 millions	+10.59

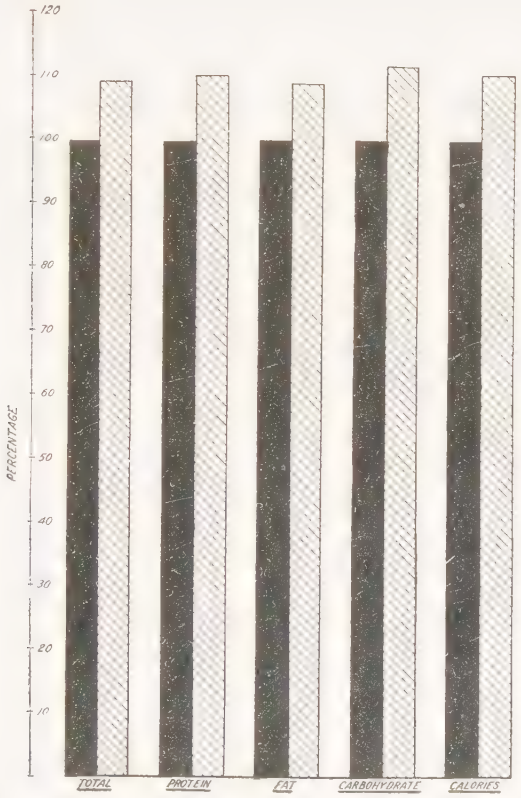

FIG. 5.—Diagram showing relative increase in average annual human food production in the war years as compared with prewar. The prewar annual average is taken as 100 per cent. (black bar) and the war annual average is shown as a cross hatched bar.

The greatest average annual increase is in carbohydrate, then follow calories and protein close together. Fat production shows

the smallest relative increase over prewar conditions. In general the war years show about 10 per cent. increase in production of human food over the prewar. This result is shown graphically in Fig. 5.

This increase in production of food in the United States during the four war years is the result of two circumstances: first, favorable crop conditions in the first two years of the war, and second, heavy export demand with associated high prices, which led the farmer to plant large acreages. That the second of these factors alone will not suffice to bring about increased production, unless the first is present, is shown by the conditions in 1917–18, when the production fell off badly in the face of the highest prices known for many years for farm products.

It is instructive in this connection to compare 1917–18, our first year in the war as a combatant, with the three preceding war years. Owing to the fact that this country was actively involved and that furthermore the need on the part of the Allies for food from America was greater than in any prewar year of the war, there was every incentive to an increased production. But the fact is that production in 1917–18 fell distinctly below the average of the three preceding years 1914–15 to 1916–17, inclusive, for all items except fat. This is shown in Table 16.

TABLE 16.—TOTAL FOOD PRODUCTION IN 1917–18 AS COMPARED WITH THE THREE NEXT PRECEDING YEARS

Item	Change in 1917–18 production as compared with average of 3 preceding years	Per cent. increase or decrease
Total human food	− 692,941 metric tons	−0.74
Protein	− 214,794 metric tons	−4.99
Fat	+ 141,460 metric tons	+2.39
Carbohydrate	−1,669,361 metric tons	−9.51
Calories	−6,407,392 millions	−4.43

The results in this table are extremely interesting from a nutritional standpoint. It appears that while the gross total production of food in our first year in the war was only insignificantly smaller (0.8 per cent.) than the average of the three preceding war years, we were short 5 per cent. in protein, and nearly 10 per cent. in carbohydrate. In total calories we were 4.5 per cent. short. Only

in fat was the 1917–18 human food production as great as in the three preceding years, and there the excess was only 2.4 per cent. Following the lean year 1916–17, which depleted all reserves nearly to the vanishing point, it is clear that during our first year in the war our food problem was a real one. Only by a reduced domestic consumption and the most widespread and rigid conservation could there be any hope of meeting a normal export program. In later chapters the facts regarding consumption and export will be presented.

The next point to which attention may be turned is the proportionate contribution of primary and secondary foods to the total nutritional production. Taking the whole seven year period together it is seen that while only 42 per cent. of the total tonnage of human food production is primary and 58 per cent. secondary, 51 per cent. of the protein, 94 per cent. of carbohydrates and 59 per cent. of the fuel value come from the primary foods, which are of course chiefly of plant origin. The secondary or animal foods make their large contribution in fat, furnishing 83 per cent. of the total. Protein for human food is produced about equally from plant and animal sources. If we put fish, here classed as a primary food source because no feed is expended in its production, with the other animal foods the protein balance in production would be thrown definitely to the animal side.

Altogether Table 14 is an impressive object lesson to those tending to belittle the importance of foods of animal origin in the national nutrition. Any source which contributes, in fact, about half the protein and half the calories, and nearly 85 per cent. of the fat produced in the country, cannot safely be treated in a stepmotherly manner, if the proper nutrition of the nation is to be maintained. Furthermore these facts would appear to give little comfort to the vegetarian cult. The United States is a reasonably healthy nation, as populations go. This condition of health is maintained on a diet in which animal products contribute very substantial amounts, as has been seen.

The figures of Table 14 also demonstrate in a striking manner what a vast quantity of raw materials has to be grown to yield a sufficient amount of nutrients. Summing the percentages of the last line of Table 14 it is seen that only 29.0 per cent. of the total tonnage of human food materials produced is net nutrients. The remaining 71.0 per cent. of the total tonnage is made up of water,

ash, and inedible refuse. What this means may be made clear by a comparison. Suppose one found that 71.0 per cent. of his winter's coal supply was slate and stones which would not burn, and only 29.0 per cent. was real coal which would burn. That situation would exactly parallel that of the material used to stoke the human furnace. These facts are shown graphically in Fig. 6, in such way as to show the net nutrients and wastage in the total and in primary and secondary human foods.

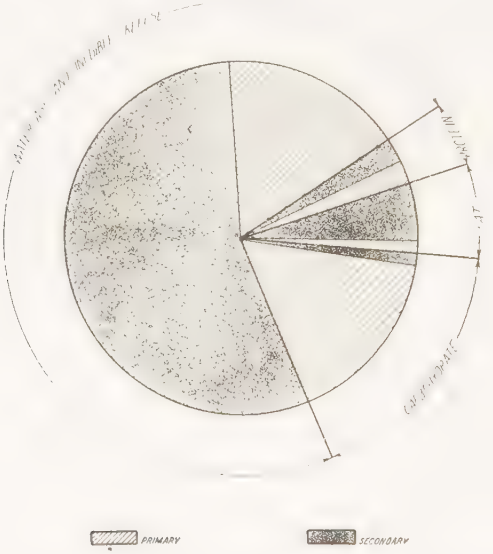

FIG. 6.—Diagram based on Table 14 to show graphically the net nutrients in human food, of primary and secondary origin. Cross-hatched areas represent primary foods, and stippled areas secondary foods.

The next point to which attention may be turned is that of the relation of production to population. Many years ago Malthus argued that population always tends to outrun subsistence. It is of course clear at once that in a food-exporting country like the United States subsistence is still far ahead of population, but it is desirable to set forth here the facts as to per capita production during the period covered by the study.

The population of continental United States, as estimated by the Bureau of the Census for January 1 of each year (the mid-point of the fiscal years used in this study) is shown in Table 17.

TABLE 17.—POPULATION OF CONTINENTAL UNITED STATES

Year	Population, January 1
1912	94,736,339
1913	96,354,333
1914	97,972,327
1915	99,590,321
1916	101,208,315
1917	102,826,309
1918	104,444,303

Table 18 shows the total per capita *production* of human food materials in the successive years. It must be clearly remembered that these are gross *production* figures, *not* consumption statistics. Those will be presented later.

TABLE 18.—HUMAN FOOD PRODUCTION PER CAPITA PER YEAR IN THE UNITED STATES

Year	Foods as commodities per capita, kg.	Protein per capita, kg.	Fat per capita, kg.	Carbohydrate per capita, kg.	Total nutrients per capita, kg.	Calories per capita (millions)
1911–12	875.4	39.0	58.8	147.8	245.6	1.3130
1912–13	913.1	40.9	56.5	164.4	261.8	1.3680
1913–14	877.5	40.2	54.8	163.5	258.5	1.3453
1914–15	946.9	43.4	59.3	180.5	283.2	1.4702
1915–16	974.4	46.2	58.0	197.7	301.9	1.5407
1916–17	862.7	38.0	57.9	142.6	238.5	1.2795
1917–18	892.2	39.1	57.9	152.0	249.0	1.3235
Annual average whole period.....	906.1	41.0	57.6	164.1	262.7	1.3773
Annual average 3 prewar years...	888.7	40.0	56.7	158.6	255.3	1.3423
Annual average war period.....	918.5	41.6	58.3	167.9	267.8	1.4021

It is evident from this table that there is as yet no occasion for worry along Malthusian lines in this country, so far as subsistence is concerned. Not only do we produce more food than we consume, but there is no definite falling off in the ratio between subsistence

produced and population. There were more total nutrients per capita produced in human foods in 1917–18 than in 1911–12. Furthermore the annual average production of all nutrients, separately and combined, was distinctly higher during the war period than before the war.

We may turn now to one of the most interesting points in the whole study, namely the relative nutritional importance of the productions of different commodity groups and single commodities. In making an analysis of this point it is desirable to get as long a time base as possible, in order to eliminate the effect of fluctuations in the crops in individual years. Consequently averages for the whole period of seven years have been used throughout. Tables 19 and 22 give the annual average nutritional content of each of the several primary and secondary human food groups. These seven year averages are first stated in absolute figures (metric tons) and then as percentages of the total. Finally the percentages are cumulated.

TABLE 19.—ANNUAL AVERAGE AMOUNT OF PROTEIN PRODUCED IN THE FORM OF PRIMARY AND SECONDARY HUMAN FOODS, ARRANGED BY COMMODITY GROUPS

Group	Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.
Grains	1,698,456	41.64	41.64
Meats	1,013,773	24.85	66.49
Dairy products	755,861	18.53	85.02
Poultry and eggs	247,789	6.07	91.09
Vegetables	218,382	5.35	96.44
Fish	80,852	1.98	98.42
Oils and nuts	44,559	1.09	99.51
Fruits	19,362	0.48	99.99
Sugars	454	0.01	100.00
Total	4,079,488	100.00	

TABLE 20.—ANNUAL AVERAGE AMOUNT OF FAT PRODUCED IN THE FORM OF PRIMARY AND SECONDARY HUMAN FOODS, ARRANGED BY COMMODITY GROUPS

Group	Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.
Meats	3,166,785	55.20	55.20
Dairy products	1,427,736	24.89	80.09
Oils and nuts	668,325	11.65	91.74
Grains	246,055	4.29	96.03
Poultry and eggs	174,502	3.04	99.07
Vegetables	21,775	0.38	99.45
Fish	17,863	0.31	99.76
Fruits	13,965	0.24	100.00
Sugars	0	0.00	100.00
Total	5,737,006	100.00	

TABLE 21.—ANNUAL AVERAGE AMOUNT OF CARBOHYDRATE PRODUCED IN THE FORM OF PRIMARY AND SECONDARY HUMAN FOODS, ARRANGED BY COMMODITY GROUPS

Group	Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.
Grains	11,759,884	71.97	71.97
Sugars	1,595,489	9.77	81.74
Vegetables	1,466,800	8.98	90.72
Dairy products	923,829	5.65	96.37
Fruits	556,184	3.40	99.77
Oils and nuts	33,075	0.20	99.97
Meats	4,945	0.03	100.00
Poultry and eggs	0	0.00	100.00
Fish	0	0.00	100.00
Total	16,340,206	100.00	

TABLE 22.—ANNUAL AVERAGE ENERGY VALUE IN CALORIES OF PRIMARY AND SECONDARY HUMAN FOODS PRODUCED IN THE UNITED STATES

Group	Total calories (000,000 omitted)	Per cent. of total calories	Cumulated per cent.
Grains	57,481,097	41.91	41.91
Meats	33,661,696	24.54	66.45
Dairy products	20,181,684	14.71	81.16
Vegetables	7,116,816	5.19	86.35
Sugars	6,544,917	4.77	95.89
Oils and nuts	6,536,639	4.77	91.12
Poultry and eggs	2,637,606	1.92	97.81
Fruits	2,488,099	1.81	99.62
Fish	515,051	0.38	100.00
Total	137,163,605	100.00	

The data from these tables are exhibited graphically in Fig. 7.

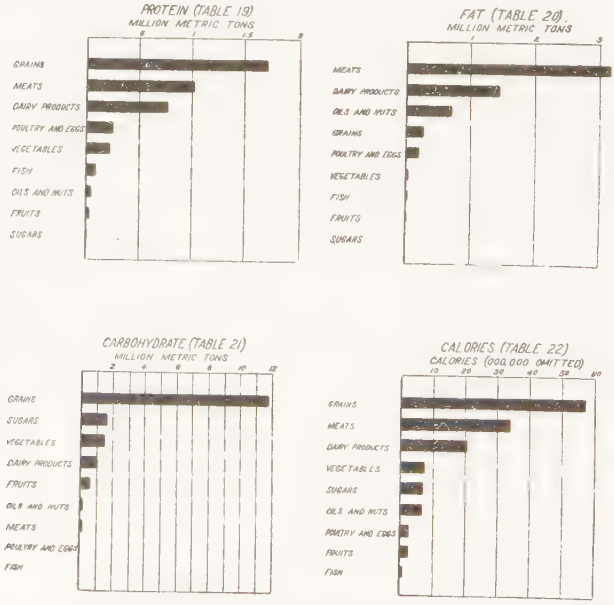

FIG. 7.—Diagrams showing the relative importance of the different main groups of human foods, in the production of nutrients in the United States.

The results of these tabulations are of interest and significance from the standpoint of national nutrition. Taking first protein we see that approximately 85 per cent. of our total production of protein for human food purposes is contained in the three commodity groups, grains, meats and dairy products. Of the remainder 11.5 per cent. is produced in two groups, viz., poultry and eggs, and vegetables. Nearly 42 per cent. of the total protein produced in human foods in this country is derived from the grains and 25 per cent. from the meats.

Approximately 92 per cent. of the nutrient fat produced in the form of human foods comes from three sorts of commodities; namely, meats with 55 per cent. of the total, dairy products with 25 per cent. of the total, and oils and nuts with 12 per cent. of the total.

Ninety-one per cent. of the carbohydrates are produced in the grains sugars and vegetables, with the grains preëminent (72 per cent. of the total).

In the total production of energy values (calories) in human food the grains are again outstanding, with 42 per cent. of the total. With meats and dairy products they make up 81 per cent. of the total calory production. Oils and nuts and sugars stand on approximately an equal basis, with about 5 per cent. each.

Altogether it is plain that in the production of human foods in this country, grains, meats and dairy products are the most important sources, in the order named. Outstandingly the United States is a grain producing nation.

Let us turn next to a consideration of the relative nutritional importance of the production of individual commodities used as human food. The data are given in Tables 23 to 26 inclusive. These tables are drawn up on the same plan as those for the commodity groups just examined. Seven year annual averages were made from the earlier basic tables for each commodity. These means are then arranged in descending order of importance, first in absolute and then in percentage terms.

TABLE 23.—ANNUAL AVERAGE AMOUNT OF PROTEIN PRODUCED IN EACH PRIMARY AND SECONDARY HUMAN FOOD

Order	Commodity	Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.
1	Wheat (nutrients in flour)	1,407,230	34.50	34.50
2	Dairy products	755,861	18.53	53.03
3	Beef	475,401	11.66	64.69
4	Pork and lard	363,875	8.92	73.61
5	Cornmeal (maize meal)	179,822	4.41	78.02
6	Eggs	157,945	3.87	81.89
7	Potatoes	118,753	2.91	84.80
8	Poultry	89,844	2.20	87.00
9	Fish	80,852	1.98	88.98
10	Edible offal from hogs	63,416	1.55	90.53
11	Beans	52,043	1.28	91.81
12	Peanuts	44,559	1.09	92.90
13	Mutton and lamb	38,021	0.93	93.83
14	Veal	37,692	0.92	94.75
15	Oatmeal	34,985	0.86	95.61
16	Hominy	33,364	0.82	96.43
17	Edible offal from cattle	27,642	0.68	97.11
18	Rice	21,619	0.53	97.64
19	Sweet potatoes	15,288	0.38	98.02
20	Rye flour	14,072	0.34	98.36
21	Peas (other than canned)	12,815	0.31	98.67
22	Apples	9,068	0.22	98.89
23	Cabbage	4,476	0.11	99.00
24	Canned corn	4,057	0.10	99.10
25	Canned peas	3,866	0.10	99.20
26	Buckwheat flour	3,689	0.09	99.29
27	Barley meal	3,675	0.09	99.38
28	Canned tomatoes	3,565	0.09	99.47
29	Onions	3,519	0.09	99.56
30	Edible offal from calves	3,472	0.09	99.65
31	Peaches	3,399	0.08	99.73
32	Edible offal from sheep and lambs	3,253	0.08	99.81
33	Raisins	2,263	0.06	99.87
34	Oranges	1,755	0.04	99.91
35	Prunes	1,395	0.03	99.94
36	Oleomargarine	1,001	0.02	99.96
37	Pears	871	0.02	99.98
38	Apricots, dried	610	0.01	99.99
39	Honey	454	0.01	100.00
	Beet sugar	0	0	100.00
	Domestic cane sugar	0	0	100.00
	Molasses	0	0	100.00
	Glucose and grape sugar	0	0	100.00
	Sorghum syrup	0	0	100.00
	Maple sugar	0	0	100.00
	Maple syrup	0	0	100.00
	Cottonseed oil	0	0	100.00
	Corn oil	0	0	100.00
	Cocoanut oil	0	0	100.00
	Olive oil	0	0	100.00
	Oleo oil for export	0	0	100.00
	Total	4,079,487*	100.00	

*The slight difference between this mean and that of Table 14 is due simply to the different arithmetical procedures employed in the two cases.

TABLE 24.—ANNUAL AVERAGE AMOUNT OF FAT PRODUCED IN EACH PRIMARY AND SECONDARY HUMAN FOOD

Order	Commodity	Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.
1	Pork and lard	2,431,753	42.387	42.387
2	Dairy products	1,427,736	24.887	67.274
3	Cottonseed oil	552,020	9.622	76.896
4	Beef	481,656	8.396	85.292
5	Wheat (nutrients in flour)	123,537	2.153	87.445
6	Eggs	112,818	1.967	89.412
7	Cornmeal (maize meal)	100,700	1.755	91.167
8	Peanuts	83,464	1.455	92.622
9	Mutton and lamb	70,193	1.223	93.845
10	Oleomargarine	69,264	1.207	95.052
11	Poultry	61,684	1.075	96.127
12	Oleo oil for export	40,384	0.704	96.831
13	Corn oil	30,525	0.532	97.363
14	Edible offal from hogs	30,329	0.529	97.892
15	Edible offal from cattle	25,569	0.446	98.338
16	Fish	17,863	0.311	98.649
17	Oatmeal	15,549	0.271	98.920
18	Veal	14,980	0.261	99.181
19	Apples	9,068	0.158	99.339
20	Potatoes	6,597	0.115	99.454
21	Sweet potatoes	6,552	0.114	99.568
22	Beans	4,163	0.073	99.641
23	Raisins	2,952	0.052	99.693
24	Hominy	2,413	0.042	99.735
25	Rye flour	1,862	0.032	99.767
26	Cocoanut oil	1,825	0.032	99.799
27	Canned corn	1,739	0.030	99.829
28	Edible offal from sheep and lambs	1,446	0.025	99.854
29	Edible offal from calves	1,211	0.021	99.875
30	Barley meal	763	0.013	99.888
31	Onions	754	0.013	99.901
32	Pears	697	0.012	99.913
33	Buckwheat flour	691	0.012	99.925
34	Peaches	680	0.012	99.937
35	Cabbage	639	0.011	99.948
36	Canned tomatoes	594	0.010	99.958
37	Rice	540	0.010	99.968
38	Peas (other than canned)	521	0.009	99.977
39	Olive oil	493	0.009	99.986
40	Oranges	439	0.008	99.994
41	Canned peas	215	0.004	99.998
42	Apricots, dried	130	0.002	100.000
	Beet sugar	0	0	100.000
	Domestic cane sugar	0	0	100.000
	Molasses	0	0	100.000
	Glucose and grape sugar	0	0	100.000
	Honey	0	0	100.000
	Sorghum syrup	0	0	100.000
	Maple sugar	0	0	100.000
	Maple syrup	0	0	100.000
	Prunes	0	0	100.000
	Total	5,737,008	100.00	

TABLE 25.—ANNUAL AVERAGE AMOUNT OF CARBOHYDRATE PRODUCED IN EACH PRIMARY AND SECONDARY HUMAN FOOD

Order	Commodity	Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.
1	Wheat (nutrients in flour)	9,270,190	56.732	56.732
2	Cornmeal (maize meal)	1,580,038	9.670	66.402
3	Potatoes	969,815	5.935	72.337
4	Dairy products	923,829	5.654	77.991
5	Beet sugar	674,897	4.130	82.121
6	Glucose and grape sugar	399,985	2.448	84.569
7	Apples	326,463	1.998	86.567
8	Hominy	317,672	1.944	88.511
9	Sweet potatoes	239,174	1.464	89.975
10	Domestic cane sugar	217,241	1.329	91.304
11	Rice	213,484	1.306	92.610
12	Rye flour	162,863	0.997	93.607
13	Oatmeal	145,554	0.891	94.498
14	Beans	137,856	0.843	95.341
15	Molasses	130,630	0.799	96.140
16	Honey	92,080	0.564	96.704
17	Raisins	67,407	0.413	97.117
18	Sorghum syrup	60,909	0.373	97.490
19	Peaches	52,350	0.320	97.810
20	Prunes	48,205	0.295	98.105
21	Buckwheat flour	44,840	0.274	98.379
22	Oranges	33,785	0.207	98.586
23	Peanuts	33,075	0.202	98.788
24	Peas (other than canned)	32,298	0.198	98.986
25	Canned corn	27,532	0.168	99.154
26	Barley meal	25,243	0.154	99.308
27	Onions	22,374	0.137	99.445
28	Pears	19,866	0.122	99.567
29	Cabbage	15,345	0.094	99.661
30	Maple syrup	15,139	0.093	99.754
31	Canned tomatoes	11,882	0.073	99.827
32	Canned peas	10,524	0.064	99.891
33	Apricots, dried	8,108	0.050	99.941
34	Maple sugar	4,608	0.028	99.969
35	Edible offal from hogs	2,757	0.017	99.986
36	Edible offal from cattle	1,728	0.011	99.997
37	Edible offal from sheep and lambs	460	0.003	100.000
	Cottonseed oil	0	0	100.000
	Corn oil	0	0	100.000
	Cocoanut oil	0	0	100.000
	Olive oil	0	0	100.000
	Fish	0	0	100.000
	Beef	0	0	100.000
	Veal	0	0	100.000
	Edible offal from calves	0	0	100.000
	Pork and lard	0	0	100.000
	Mutton and lamb	0	0	100.000
	Oleomargarine	0	0	100.000
	Oleo oil for export	0	0	100.000
	Poultry	0	0	100.000
	Eggs	0	0	100.000
	Total	16,340,206	100.000	

TABLE 26.—ANNUAL AVERAGE ENERGY VALUE IN CALORIES PRODUCED IN EACH PRIMARY AND SECONDARY HUMAN FOOD

Order	Commodity	Total calories (000,000 omitted)	Per cent. of total calories	Cumulated per cent.
1	Wheat (nutrients in flour)	44,933,046	32.759	32.759
2	Pork and lard	24,115,012	17.581	50.340
3	Dairy products	20,181,684	14.714	65.054
4	Cornmeal (maize meal)	8,153,294	5.944	70.998
5	Beef	6,447,035	4.700	75.698
6	Cottonseed oil	5,136,183	3.745	79.443
7	Potatoes	4,525,084	3.299	82.742
8	Beet sugar	2,767,465	2.018	84.760
9	Eggs	1,693,073	1.234	85.994
10	Glucose and grape sugar	1,640,167	1.196	87.190
11	Apples	1,466,105	1.069	88.259
12	Hominy	1,462,745	1.066	89.325
13	Sweet potatoes	1,107,446	0.807	90.132
14	Peanuts	1,094,847	0.798	90.930
15	Rice	971,685	0.708	91.638
16	Poultry	944,533	0.689	92.327
17	Domestic cane sugar	890,813	0.649	92.976
18	Oatmeal	885,543	0.646	93.622
19	Beans	818,440	0.597	94.219
20	Mutton and lamb	809,200	0.590	94.809
21	Rye flour	743,647	0.542	95.351
22	Oleomargarine	648,513	0.473	95.824
23	Edible offal from hogs	556,193	0.405	96.229
24	Molasses	535,657	0.391	96.620
25	Fish	515,051	0.376	96.996
26	Honey	380,000	0.277	97.273
27	Oleo oil for export	375,715	0.274	97.547
28	Edible offal from cattle	359,931	0.262	97.809
29	Raisins	313,482	0.229	98.038
30	Veal	295,634	0.216	98.254
31	Corn oil	284,049	0.207	98.461
32	Sorghum syrup	249,751	0.182	98 643
33	Peaches	232,321	0.169	98.812
34	Buckwheat flour	205,772	0.150	98.962
35	Prunes	203,320	0.148	99.110
36	Peas (other than canned)	190,071	0.139	99.249
37	Oranges	147,998	0.108	99.357
38	Canned corn	145,351	0.106	99.463
39	Barley meal	125,365	0.091	99.554
40	Onions	113,190	0.083	99.637
41	Cabbage	88,098	0.064	99.701
42	Pears	87,978	0.064	99.765
43	Canned tomatoes	68,763	0.050	99.815
44	Maple syrup	62,169	0.045	99.860
45	Canned peas	60,373	0.044	99.904
46	Apricots, dried	36,894	0.027	99.931
47	Edible offal from sheep and lambs	28,829	0.021	99.952
48	Edible offal from calves	25,634	0.019	99.971
49	Maple sugar	18,895	0.014	99.985
50	Cocoanut oil	16,977	0.012	99.997
51	Olive oil	4,582	0.003	100.000
	Total	137,163,603	100.000	

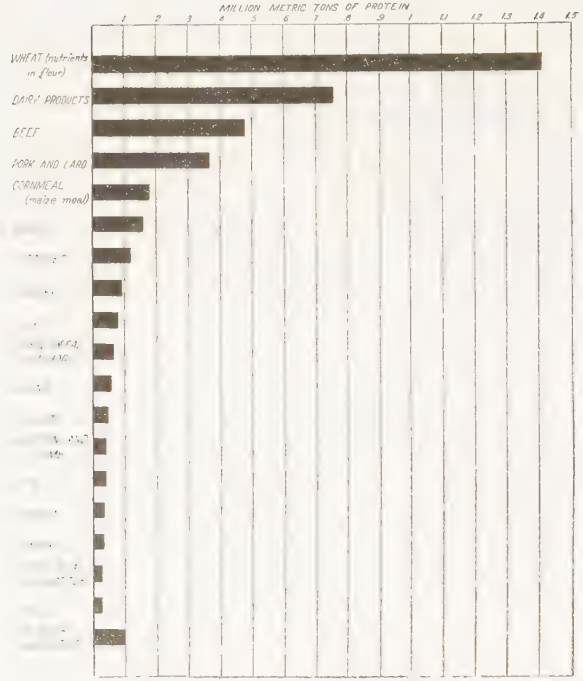

FIG. 8.—Diagram showing the relative importance of the different human food commodities in the production of protein in the United States.

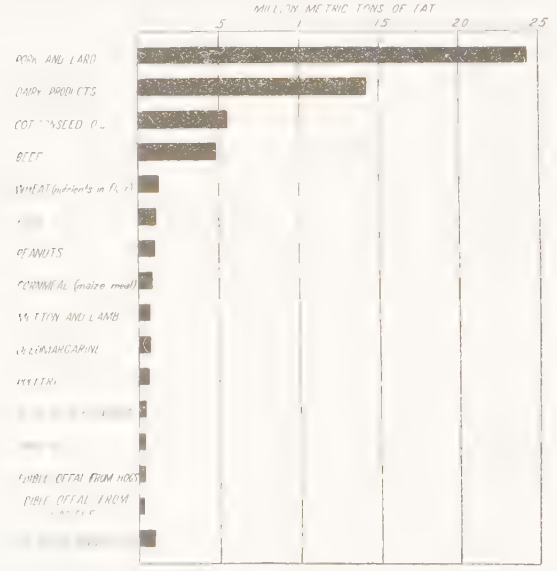

FIG. 9.—Diagram showing the relative importance of the different human food commodities in the production of fat in the United States.

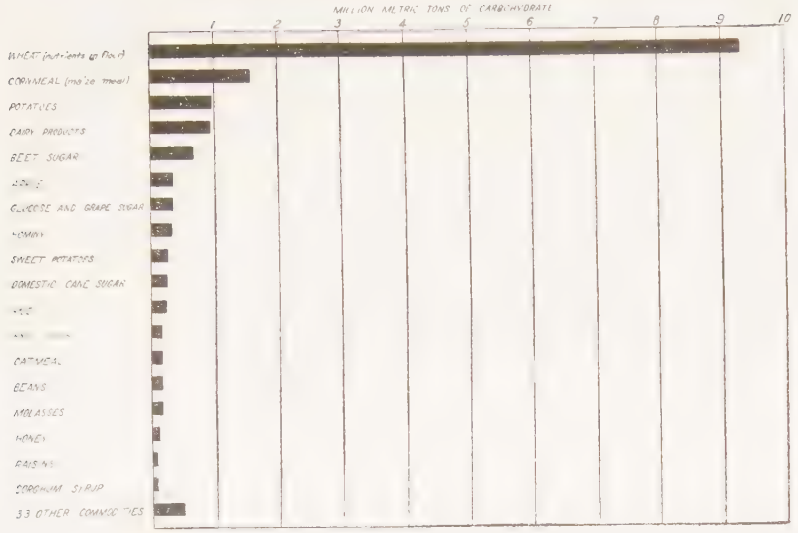

FIG. 10.—Diagram showing the relative importance of the different human food commodities in the production of carbohydrate in the United States.

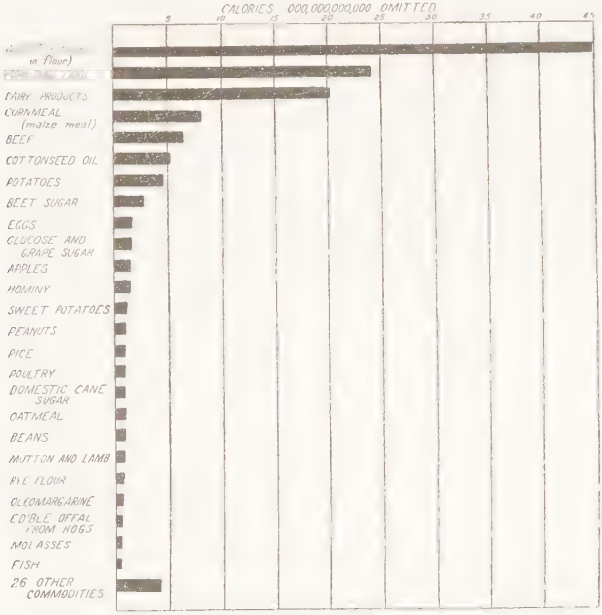

FIG. 11.—Diagram showing the relative importance of the different human food commodities in the production of energy values (calories) in the United States.

Figures 8 to 11 inclusive are diagrams based on Tables 23 to 26. The bars show the relative importance of the several commodities in respect of production.

The outstanding position of wheat in the human food production of this country is the most striking feature of these tables. It stands first in the production of protein, carbohydrate and calories, and fifth in the production of fat. No other raw material source of human food stands near it in general importance. These tables show very clearly why it is that so much stress was laid upon this commodity in connection with the food factor in winning the war. Even though the claim be allowed that there are plenty of other foods just as good as wheat the fact still remains that in bulk significance in the production of human nutriment in this country wheat stands in a class by itself. The energy content of the wheat crop is nearly double that of its nearest competing commodity. The same is true of the protein content, while in carbohydrate content the average net wheat crop for human consumption is about 6 times as great as that of the closest competing commodity. About 2 per cent. of all the fat for human nourishment produced in this country is in the wheat crop.

Next to wheat in all round nutritional importance from the production standpoint in this country comes the hog. This lowly creature stands far and away ahead of any other source in the production of fat for human nourishment, with over 42 per cent. of the total production of this nutrient to its credit. It stands fourth in the production of protein, and second in the production of total energy values.

The third outstanding producer of human nutriment is the dairy cow. She stands second in the production of protein and fat, fourth in the production of carbohydrate, and third in energy value. If we take into account the nutritional significance of the dairy products in the broadest sense, including a valuation of the growth promoting substances of milk, it would probably be correct to place the dairy cow ahead of the hog as a contributor to our food resources. Leaving further discussion of this point aside, however, until we have consumption figures in hand, it is entirely clear that the wheat crop, the hog, and the cow together comprise our great reservoir of human nutrients. Together they produce 62 per cent. of all the protein and carbohydrate used as human food, 69 per cent. of all the fat, and 65 per cent. of all the calories.

The second most striking feature of Tables 23 to 26 consists in the fact that only a comparatively few commodities are at all significant individually in the total nutrient production of the coun-

try. In the case of protein there are only 12 commodities which individually contribute as much as 1 per cent. to the total production, and only 8 that contribute as much as 2 per cent. The total fish catch, for example, furnishes less than 2 per cent. of the total protein produced in the country. There are only 11 commodities individually contributing as much as 1 per cent. of the total fat produced for human food. The same is true of carbohydrate production, of which there are 12 commodities each contributing 1 per cent. or more to the total energy production.

These facts make it evident that any campaign for increased food production, to be really effective in a nutritional sense, must be concentrated on a very few of the great staples. Even if one multiplied the onion crop, for example, by such a practically impossible amount as ten fold it would still contribute something less than 1 per cent. of the total calory production in the form of human foods. The United States Department of Agriculture has showed great wisdom during the war in concentrating its production campaign chiefly on wheat and hogs.

Another point in the same connection relates to the home garden movement. That it was and is in every respect a highly laudable, patriotic, and to some extent economical thing for everyone who can do so to grow food in his back yard, goes without saying. But the public is prone to over-estimate the nutritional significance of this sort of activity. When it is remembered that the *total commercial production* on the farms of the country of sweet potatoes, beans, peas, onions, cabbage, and of corn, peas, and tomatoes for commercial canning, amounts *altogether* to only 2 per cent. of the total calory production in human foods, and further when one recalls that the home garden production of vegetables cannot possibly be more than a very small fraction of the commercial production of vegetables, it is clear that the home gardens can contribute to the total nutritional resources of the country only an extremely insignificant bit.

Again, the poultry industry considers itself, and rightly so, an important enterprise in the welfare of the country. But considered objectively as a nutritional resource, poultry and eggs together contribute less than 2 per cent. of the total production of calories in human food, only about 6 per cent. of the total protein, and about 3 per cent. of the fat.

Of the vegetables the potato is the only one which makes, by

itself, any particularly significant contribution to our food resources. This crop makes up about 3 per cent. of the total protein production, nearly 6 per cent. of the total carbohydrate production, and a little over 3 per cent. of the calorie production.

Taking all the data of Tables 23 to 26 together it is clear that the statistics on human food production given in this and the preceding chapters must be within 2 or 3 per cent. of absolute completeness, from the nutritional point of view. For the minor crops which are here omitted obviously produce far less net nutrient material than those listed in the last half of Tables 23 to 26. But the last 24 commodities listed in Table 26 contribute *all together* less than 3 per cent. of the total energy value of the 48 human foods listed. And these last 24 items include such crops as fish, veal, peas, onions, cabbages, oranges, peaches, etc. It is obvious that the omission of such things as strawberries, blueberries, mushrooms, cucumbers, celery, home garden vegetables, etc., cannot possibly have affected significantly the net result.

In concluding this chapter I wish to emphasize once more what was said at the beginning, lest there may be any misunderstanding on the reader's part, namely, that in this chapter we have dealt with figures of *production* only, not consumption, and of *human foods* only, not feeds or fodders.

CHAPTER VI

GROSS IMPORTS OF PRIMARY AND SECONDARY FOODS

(Commodity Reference Nos. 49–97)

Having dealt with the production of human foods in the United States we turn, as the next step in the analysis which will finally end in consumption statistics, to a consideration of the human food materials which come into this country in the way of imports. Here the basic statistics are those of the Department of Commerce.[1] Included in the food imports as here given are the shipments of food materials from Porto Rico and Hawaii to the United States. Those from Alaska are allowed for in production (fish) and those from the Philippine Islands are included in the Department of Commerce import figures.

The present chapter deals with gross imports only, and in consequence no deductions are made here for industrial uses and the like from the gross imports as given by the Department of Commerce. When later we come to apply *net* imports and exports to the determination of consumption, proper deductions for the factors mentioned will be made.

Unfortunately it has not been possible to include every item of foodstuffs imported, for the reason that the import statistics of certain minor items are given in values only and not in pounds or other unit of quantity. It would be an extremely hazardous procedure to attempt to convert values to quantities on these items, particularly for earlier years. Hence it has seemed wisest to leave such items out of the tables altogether. In any case they are insignificant nutritionally. A few other items such as mushrooms and truffles, were omitted because of their slight nutritional significance.

In a few cases it has been necessary to estimate the imports for the earlier years, because in those years the figures for these particular commodities were not separately stated in the reports of the

[1] Monthly Summary of Foreign Commerce of the United States, Department of Commerce, Bureau of Foreign and Domestic Commerce.

Department of Commerce. Instead they were then included in some general "all other" class. In making such estimates the guide has been the importation in the years when it was definitely known.

The gross imports, under the same general classifications as were used in Table 7, Chapter III, of primary foodstuffs are exhibited in Table 28. Notations regarding the separate commodities are as follows:

GRAINS AND THEIR DERIVATIVE PRODUCTS

49. Macaroni.—This item includes besides macaroni, the other alimentary paste products, spaghetti, vermicelli and spaghetti and the like. The analytical figures used were the averages of the analyses of macaroni, vermicelli and spaghetti, as given by Atwater and Bryant.

50. Rice.—This item includes the cleaned and rough (uncleaned) whole rice imported from all foreign countries and from our insular possessions, especially Hawaii. The uncleaned rice imports have been converted to a cleaned basis, before calculating the nutrients, so that the one item includes both cleaned and rough as cleaned.

51. Rice Flour.—This item includes rice flour, meal and broken rice. This agglomerate was assumed to have the same nutritive values as whole cleaned rice. A deduction will be made farther on for fodder and non-food uses of this item.

52. Wheat.—The nutrients in the flour from all the wheat imported were calculated, making allowance for a different rate of extraction in 1917–18, as in the case of our domestic production. Deductions will be made later.

53. Wheat Flour.—Total nutrients calculated.

VEGETABLES

54. Beans and Lentils.—The nutritional factors for this item were obtained by averaging Atwater and Bryant's factors for dried beans, dried lima beans and lentils.

55. Onions.—Nutrients in total imports calculated. Deductions for spoilage will be made later.

56. Peas, Dried.—Nutrients in total imports calculated.

57. Potatoes.—This item does not include sweet potatoes, the imports of which are too small to be separately listed by the Department of Commerce. The nutrients in the total imports were calculated. Deductions for spoilage will be made later.

SACCHARINE MATERIALS

58. Honey.—The Department of Commerce has given separate import figures on this item only for the fiscal years 1917–18 and 1916–17. The figures for the earlier years are estimates based on the assumption that the imports of this commodity were much smaller in the years when it was included in "all other articles."

59. Molasses.—Here the same nutrient factors as for domestic molasses were used, which, it will be recalled, left out the ostensible protein content on the ground that this was really nutritionally inert nitrogenous matter. Deductions from this item for industrial uses will be made later.

60. Beet Sugar.—Nutrients of total imports as refined sugar calculated.

61. Cane Sugar.—Cane sugar is imported into the United States in the form of raw sugar to the extent of all but a trifling amount. Before calculating nutrients the imports have been converted to terms of refined sugar (see p. 170 *supra* for the reason), on the assumption that 100 pounds of raw yields 93 pounds of refined.

62. Maple Sugar and Syrup.—The analytic factors used for this item were the averages of Atwater and Bryant's factors for maple sugar and maple syrup. Inasmuch as imports of these commodities were not separately reported until 1914–15 I have estimated the import of the three first years at the average of the four following years.

FRUITS

63. Bananas.—The import statistics are given in units of bunches. The average weight of a bunch has been taken here as 54 pounds and the Department of Commerce figures converted from bunches to pounds before calculating nutrients. A deduction of 10 per cent. is made for the stems before calculating nutrients. A further deduction for spoilage will be made later.

64. Currants.—Nutrients in total imports calculated.

65. Dates.

66. Figs.

67. Raisins.—In items 65, 66 and 67 the nutrients in the total imports have been calculated.

68. Olives.—Inasmuch as there is a great variation in the analysis of olives as reported by different authorities, and as import figures are given in gallons, and furthermore as both ripe and green

olives are imported and differ considerably in composition, it becomes a puzzling matter to decide upon proper nutrient factors for this item. After studying the matter it has been decided to take the Atwater and Bryant figure for green olives as purchased, as probably being as near to a fair average as one can get. A gallon of olives is taken to weigh 8.1 pounds.

69. Oranges.—On this item a departure has been made from the general rule of not considering imports stated in values only. Because of the desirability of getting a consumption figure for this fruit it was felt to be desirable to make some estimate of the imports in terms of poundage, using the value figures as the basis. This has been done with results which, if admittedly rough, are certainly nearer the truth than would be a complete omission of this import item.

VEGETABLE OILS AND NUTS

70. Almonds.
71. Filberts.
72. Peanuts.
73. Walnuts.

In items 70 to 73 inclusive the nutrients in the total imports have been calculated. Inasmuch as a portion of the imports in each of these cases is in the form of shelled nut meats, and the balance in the form of unshelled nuts, the nutrients have been separately calculated for the two moieties, and then the results combined to give the values here used.

74. Cocoanut, Shredded.—Only the shredded or manufactured portion of the cocoanut imports is taken here, because the edible oil from the rest of the cocoanut importation has been taken account of under production. The shredded cocoanut is used directly as human food.

75. Cream and Brazil Nuts.—Nutrients in the total imports were calculated.

76. Chinese Nut Oil.
77. Edible Olive Oil.

In items 76 and 77 the nutrients in the total importation have been calculated. No deductions are made here or later, as these oils are practically entirely used for food purposes.

78. Cocoanut Oil.
79. Cottonseed Oil.

In items 78 and 79 deductions for industrial uses will be made later. Here the nutrients of the total imports are taken.

80. Cacao, Crude.—This and the following item are included in the general group of oils and nuts, not because they have a completely logical status here, but because in a nutritional way they come nearer to this than to any other main group. The outstanding nutritional contribution of cacao and its products is fat.

The analytical figures for crude cacao were taken from Leach. In determining the protein factor the theobromine content was first subtracted from the total nitrogenous material. The factors here given are for the whole bean, nut and shell.

Here the entire nutrients in the imports are taken. Deductions will be made later for extracted cocoa butter industrially used.

81. Cocoa and Chocolate, Mfd.—This item does not include confectionery, but does include all other manufactured cocoa and chocolate. No deductions are made from this item, either here or later. For the analytical factors the average of Atwater and Bryant's figures for cocoa and for chocolate was used.

82. Cured Fish.—This item includes the following rubrics of the Department of Commerce Reports: "Cured cod, haddock, hake and pollock," "Cured herring" and "Cured mackerel." The analytical factors used are the averages of Atwater and Bryant's figures for (*a*) salt cod as purchased, (*b*) smoked haddock as purchased, (*c*) mackerel, salt, entrails removed, as purchased, (*d*) smoked herring as purchased, the salt cod being weighted twice to the others once, to allow for salt herring for which analyses are not available, and for the larger amount of cod in the composite figure.

83. Fresh Fish.—For this item the same nutrient factors were used as in the case of the item fish (No. 35) in Table 7. Since these figures were for edible portions only the same deduction for refuse, 48.184 per cent., has been made from the gross import figures as in the production statistics, before calculating the nutrients.

84. Crab Meat.—Nutrients in total importation calculated.

85. Lobsters.—This item includes both whole or fresh and canned lobsters.

The nutrients were calculated separately for the two sorts and the results combined.

The factors used in calculating nutrients in short tons from the commodity units given are exhibited in Table 27. The values got by these factors are changed to metric tons by multiplying by 0.9072.

TABLE 27.—FACTORS BY WHICH AMOUNTS, IN ORIGINAL UNITS, OF IMPORTED PRIMARY FOOD COMMODITIES ARE TO BE MULTIPLIED TO GET SHORT TONS OF NUTRIENTS

Commodity reference No.	Commodity	Original specified unit of measure	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
49	Macaroni	lb.	0.000061	0.000005	0.000371	0.001650
50	Rice	lb.	0.000040	0.000001	0.000395	0.001631
51	Rice flour	lb.	0.000040	0.000001	0.000395	0.001631
52	Wheat*	bu.	0.002483	0.000218	0.016357	0.071925
53	Wheat flour	bbl.	0.011172	0.000980	0.073598	0.323616
54	Beans and lentils	bu.	0.006630	0.000430	0.018470	0.097000
55	Onions	bu.	0.000392	0.000084	0.002492	0.011437
56	Peas, dried	bu.	0.007380	0.000300	0.018600	0.099300
57	Potatoes	bu.	0.000540	0.000030	0.004410	0.018667
58	Honey	gal.	0.000024	0	0.004372	0.018240
59	Molasses	gal.	0	0	0.003575	0.013299
60	Beet sugar	lb.	0	0	0.000500	0.001860
61	Cane sugar	lb.	0	0	0.000500	0.001860
62	Maple sugar and syrup	lb.	0	0	0.000385	0.001435
63	Bananas	lb.	0.000004	0.000002	0.000064	0.000270
64	Currants	lb.	0.000012	0.000009	0.000371	0.001495
65	Dates	lb.	0.000009	0.000013	0.000353	0.001450
66	Figs	lb.	0.000021	0.000001	0.000371	0.001475
67	Raisins	lb.	0.000011	0.000015	0.000343	0.001445
68	Olives	gal.	0.000032	0.000818	0.000344	0.008303
69	Oranges	lb.	0.000002	0.000001	0.000038	0.000153
70	Almonds unshelled	lb.	0.000057	0.000151	0.000048	0.001660
	Almonds, shelled	lb.	0.000105	0.000275	0.000086	0.003030
71	Filberts, unshelled	lb.	0.000037	0.000157	0.000031	0.001575
	Filberts, shelled	lb.	0.000078	0.000327	0.000065	0.003290
72	Peanuts, unshelled	lb.	0.000097	0.000166	0.000072	0.002030
	Peanuts, shelled	lb.	0.000129	0.000220	0.000095	0.002690
73	Walnuts, unshelled	lb.	0.000024	0.000087	0.000017	0.000885
	Walnuts, shelled	lb.	0.000092	0.000322	0.000065	0.003300
74	Cocoanut, shredded	lb.	0.000031	0.000287	0.000158	0.003125
75	Cream and Brazil nuts	lb.	0.000043	0.000169	0.000017	0.001655
76	Chinese nut oil	gal.	0	0.003773	0	0.031844
77	Edible olive oil	gal.	0	0.003773	0	0.031844
78	Cocoanut oil	lb.	0	0.000490	0	0.004136
79	Cottonseed oil	lb.	0	0.000490	0	0.004136
80	Cacao, crude	lb.	0.000065	0.000203	0.000127	0.002425
81	Cocoa and chocolate, manufactured	lb.	0.000086	0.000194	0.000170	0.002590
82	Cured fish	lb.	0.000085	0.000027	0	0.000544
83	Fresh fish	lb.	0.000086	0.000019	0	0.000497
84	Crab meat	lb.	0.000079	0.000008	0.000003	0.000370
85	Lobsters, canned	lb.	0.000091	0.000005	0.000003	0.000390
	Lobsters, all other	lb.	0.000030	0.000003	0.000001	0.000140

* These are the factors for nutrients in flour from wheat for years 1911–17. For the year 1917–18 the factors are: Protein, 0.002531; fat, 0.000222; carbohydrate, 0.16672; calories, 0.073309.

The nutrient values of the gross imports are set forth in Table 28.

TABLE 28.—SHOWING THE GROSS IMPORTS OF PRIMARY FOODS INTO THE UNITED STATES FROM 1911–12 TO 1917–18 INCLUSIVE

Reference No.	Commodity	Original units	1911–12					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	108,231,028	49,093	5,989	491	36,427	178,581
50	Rice	lb.	59,604,798	27,037	2,163	54	21,359	97,215
51	Rice flour	lb.	116,576,653	52,879	4,230	106	41,774	190,137
52	Wheat	bu.	2,699,130	73,460	6,080	533	40,052	194,135
53	Wheat flour	bbl.	158,777	14,116	1,609	142	10,601	51,383
	Sub-total—Grains	...	.....	216,585	20,071	1,326	150,213	711,451
	Vegetables							
54	Beans and lentils	bu.	1,004,930	27,350	6,045	392	16,838	97,478
55	Onions	bu.	1,436,037	37,129	511	110	3,247	16,424
56	Peas, dried	bu.	806,762	21,957	5,401	220	13,613	80,111
57	Potatoes	bu.	13,734,695	373,803	6,729	374	54,948	256,386
	Sub-total—Vegetables	...	.....	460,239	18,686	1,096	88,646	450,399
	Saccharine Materials							
58	Honey	gal.	90,000	490	2	.....	397	1,642
59	Molasses	gal.	41,500,201	207,068	.....	.....	134,593	551,911
60	Beet sugar	lb.	6,504,260	2,950	.....	.....	2,950	12,098
61	Cane sugar	lb.	5,609,653,143	2,544,511	.....	.....	2,544,511	10,433,955
62	Maple sugar and syrup	lb.	2,164,000	982	.....	.....	756	3,105
	Sub-total—Sugars	...	.....	2,756,001	2	.....	2,683,207	11,002,711
	Fruits							
63	Bananas	lb.	2,414,933,406	1,095,407	8,763	4,382	140,212	652,032
64	Currants	lb.	33,151,396	15,037	361	270	11,158	49,561
65	Dates	lb.	25,208,248	11,434	206	298	8,073	36,552
66	Figs	lb.	18,765,408	8,512	357	17	6,316	27,679
67	Raisins	lb.	3,255,861	1,477	33	44	1,013	4,705
68	Olives	gal.	5,076,857	18,653	147	3,768	1,584	42,153
69	Oranges	lb.	363,000	165	1	.....	13	56
	Sub-total—Fruits	...	.....	1,750,685	9,868	8,779	168,369	812,738
	Vegetable Oils and Nuts							
70	Almonds	lb.	17,231,458	7,816	1,476	3,872	1,214	47,019
71	Filberts	lb.	11,198,991	5,080	437	1,850	366	20,473
72	Peanuts	lb.	15,558,038	7,057	1,457	2,471	1,071	33,317
73	Walnuts	lb.	37,213,674	16,880	1,601	5,668	1,132	[illegible]
74	Cocoanut, shredded	lb.	5,331,826	2,419	150	1,388	764	[illegible]
75	Cream and Brazil nuts	lb.	21,539,508	9,770	840	3,302	332	[illegible]
76	Chinese nut oil	gal.	4,767,596	16,652	.....	16,319	.....	[illegible]
77	Edible olive oil	gal.	4,836,515	16,892	.....	16,544	.....	[illegible]
78	Cocoanut oil	lb.	46,370,732	21,034	.....	20,613	.....	[illegible]
79	Cottonseed oil	lb.	1,513,051	686	.....	672	.....	[illegible]
80	Cacao, crude	lb.	145,968,945	66,211	8,607	26,882	16,817	[illegible]
81	Cocoa and chocolate, manufactured	lb.	2,816,885	1,278	220	495	435	7,296
	Sub-total—Oils and Nuts	...	.....	171,775	14,788	100,076	22,131	1,082,152
	Fish							
82	Cured fish	lb.	130,890,886	59,372	10,093	3,206	.....	71,205
83	Fresh fish	lb.	25,067,309	11,370	1,956	432	.....	12,458
84	Crab meat	lb.	2,500,000	1,134	179	18	6	925
85	Lobsters	lb.	8,848,152	4,013	426	30	14	2,076
	Sub-total—Fish	...	.....	75,889	12,654	3,686	20	86,664
	Grand Total—All Primary Food Imports	...	.....	4,831,174	76,069	114,963	3,112,586	14,146,115

TABLE 28—*Continued*

Reference No.	Commodity	Original units	1912–13 Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	106,500,752	48,308	5,894	483	35,845	175,726
50	Rice	lb.	68,261,721	30,936	2,475	62	24,440	111,237
51	Rice flour	lb.	137,608,742	62,419	4,993	125	49,310	224,440
52	Wheat	bu.	798,028	21,719	1,798	158	11,842	57,398
53	Wheat flour	bbl.	107,558	9,562	1,090	95	7,181	34,807
	Sub-total—Grains	...	.....	172,944	16,250	923	128,618	603,608
	Vegetables							
54	Beans and lentils	bu.	1,048,297	28,530	6,305	409	17,565	101,685
55	Onions	bu.	789,458	20,411	280	59	1,784	9,029
56	Peas, dried	bu.	1,134,346	30,872	7,594	308	19,141	112,641
57	Potatoes	bu.	337,230	9,178	165	9	1,349	6,298
	Sub-total—Vegetables	...	.....	88,991	14,344	785	39,839	229,653
	Saccharine Materials							
58	Honey	gal.	160,000	871	4	.....	708	2,918
59	Molasses	gal.	48,813,970	243,561	.....	.....	158,314	649,177
60	Beet sugar	lb.	182,647,582	82,848	.....	.....	82,848	339,725
61	Cane sugar	lb.	5,956,494,249	2,701,836	.....	.....	2,701,836	11,079,079
62	Maple sugar and syrup	lb.	2,164,000	982	.....	.....	756	3,105
	Sub-total—Sugars	...	.....	3,030,098	4	.....	2,944,462	12,074,004
	Fruits							
63	Bananas	lb.	2,300,248,152	1,043,386	8,347	4,173	133,553	621,067
64	Currants	lb.	30,843,735	13,991	336	252	10,381	46,111
65	Dates	lb.	34,304,951	15,561	280	405	10,986	49,742
66	Figs	lb.	16,837,819	7,638	321	15	5,667	24,836
67	Raisins	lb.	2,579,705	1,170	25	35	802	3,728
68	Olives	gal.	3,946,076	14,498	114	2,928	1,231	32,764
69	Oranges	lb.	779,200	353	2	1	27	119
	Sub-total—Fruits	...	.....	1,096,597	9,425	7,809	162,647	778,367
	Vegetable Oils and Nuts							
70	Almonds	lb.	15,670,958	7,108	1,380	3,618	1,133	43,932
71	Filberts	lb.	10,427,306	4,730	423	1,785	354	19,761
72	Peanuts	lb.	19,082,995	8,656	1,888	3,207	1,388	43,228
73	Walnuts	lb.	26,662,441	12,094	1,220	4,316	863	48,643
74	Cocoanut, shredded	lb.	6,602,556	2,995	186	1,719	946	20,633
75	Cream and Brazil nuts	lb.	11,933,445	5,413	465	1,830	184	19,750
76	Chinese nut oil	gal.	5,996,666	20,945	.....	20,525	.....	190,958
77	Edible olive oil	gal.	5,221,001	18,235	.....	17,871	.....	166,258
78	Cocoanut oil	lb.	50,504,192	22,909	.....	22,450	.....	208,885
79	Cottonseed oil	lb.	3,383,511	1,535	.....	1,504	.....	13,994
80	Cacao, crude	lb.	140,039,172	63,521	8,258	25,790	16,134	339,595
81	Cocoa and chocolate, manufactured	lb.	3,470,680	1,574	270	611	535	8,989
	Sub-total—Oils and Nuts	...	.....	169,715	14,090	105,226	21,537	1,124,626
	Fish							
82	Cured fish	lb.	132,825,185	60,249	10,242	3,253	.....	72,257
83	Fresh fish	lb.	27,446,055	12,449	2,141	473	.....	13,641
84	Crab meat	lb.	2,820,852	1,280	202	21	7	1,644
85	Lobsters	lb.	8,076,834	3,664	380	27	13	1,854
	Sub-total—Fish	...	.....	77,642	12,965	3,774	20	88,796
	Grand Total—All Primary Food Imports	...	.....	4,635,987	67,078	118,517	3,297,123	14,899,054

TABLE 28—*Continued*

Reference No.	Commodity	Original units	1913–14 Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	126,128,621	57,212	6,980	572	42,451	208,112
50	Rice	lb.	133,295,596	60,462	4,837	121	47,765	217,405
51	Rice flour	lb.	139,906,868	63,461	5,077	127	50,134	228,188
52	Wheat	bu.	1,978,937	53,858	4,458	391	29,365	142,335
53	Wheat flour	bbl.	89,911	7,994	911	80	6,003	29,097
	Sub-total—Grains	...	.....	242,987	22,263	1,291	175,718	825,137
	Vegetables							
54	Beans and lentils	bu.	1,634,070	44,473	9,828	638	27,380	158,505
55	Onions	bu.	1,114,811	28,823	396	85	2,520	12,750
56	Peas, dried	bu.	866,488	23,582	5,801	236	14,621	86,042
57	Potatoes	bu.	3,645,993	99,229	1,786	99	14,587	68,060
	Sub-total—Vegetables	...	.....	196,107	17,811	1,058	59,108	325,357
	Saccharine Materials							
58	Honey	gal.	220,000	1,197	5	.....	973	4,013
59	Molasses	gal.	71,098,507	354,751	.....	.....	236,587	945,539
60	Beet sugar	lb.	2,367,708	1,074	.....	.....	1,074	4,404
61	Cane sugar	lb.	6,340,152,101	2,875,861	.....	.....	2,875,861	11,792,683
62	Maple sugar and syrup	lb.	2,164,000	982	.....	.....	756	3,105
	Sub-total—Sugars	...	.....	3,233,865	5	.....	3,109,251	12,749,744
	Fruits							
63	Bananas	lb.	2,639,601,108	1,197,315	9,578	4,789	153,255	712,692
64	Currants	lb.	32,033,177	14,530	348	261	10,781	47,890
65	Dates	lb.	34,073,608	15,456	279	402	10,912	49,407
66	Figs	lb.	19,284,868	8,748	367	17	6,491	28,445
67	Raisins	lb.	4,554,549	2,066	45	62	1,417	6,581
68	Olives	gal.	5,316,364	19,533	154	3,945	1,659	44,142
69	Oranges	lb.	312,000	142	1	.....	11	48
	Sub-total—Fruits	...	.....	1,257,790	10,772	9,476	184,526	889,205
	Vegetable Oils and Nuts							
70	Almonds	lb.	19,038,405	8,636	1,564	4,105	1,287	49,835
71	Filberts	lb.	12,636,479	5,732	485	2,053	406	22,721
72	Peanuts	lb.	44,549,789	20,208	4,722	8,035	3,475	108,307
73	Walnuts	lb.	37,195,728	16,872	1,360	4,839	963	54,479
74	Cocoanut, shredded	lb.	10,297,554	4,671	289	2,681	1,476	32,180
75	Cream and Brazil nuts	lb.	20,423,497	9,264	797	3,132	315	33,801
76	Chinese nut oil	gal.	4,932,444	17,228	.....	16,883	.....	157,069
77	Edible olive oil	gal.	6,217,560	21,716	.....	21,282	.....	197,992
78	Cocoanut oil	lb.	74,386,213	33,741	.....	33,066	.....	307,661
79	Cottonseed oil	lb.	17,293,201	7,844	.....	7,687	.....	71,525
80	Cacao, crude	lb.	176,267,646	79,954	10,394	32,461	20,308	427,449
81	Cocoa and chocolate, manufactured	lb.	3,096,445	1,405	241	545	477	8,020
	Sub-total—Oils and Nuts	...	.....	227,271	19,852	136,769	28,707	1,471,039
	Fish							
82	Cured fish	lb.	172,103,096	78,065	13,271	4,216	.....	93,624
83	Fresh fish	lb.	36,309,380	16,470	2,833	626	.....	18,046
84	Crab meat	lb.	2,754,112	1,249	198	20	7	1,019
85	Lobsters	lb.	7,751,323	3,516	338	25	11	1,661
	Sub-total—Fish	...	.....	99,300	16,640	4,887	18	114,350
	Grand Total—All Primary Food Imports	...	.....	5,257,320	87,343	153,481	3,557,328	16,374,832

TABLE 28.—*Continued*

Reference No.	Commodity	Original units	1914-15					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	56,542,480	25,647	3,129	257	19,036	93,295
50	Rice	lb.	170,853,883	77,499	6,200	155	61,224	278,663
51	Rice flour	lb.	74,831,312	33,943	2,715	68	26,815	122,650
52	Wheat	bu.	426,469	11,607	961	84	6,329	30,674
53	Wheat flour	bbl.	64,200	5,708	650	57	4,286	20,776
	Sub-total—Grains	....	.....	154,404	13,655	621	117,684	545,458
	Vegetables							
54	Beans and lentils	bu.	905,647	24,648	5,447	353	15,175	87,848
55	Onions	bu.	829,177	21,438	295	64	1,874	9,483
56	Peas, dried	bu.	546,903	14,885	3,661	149	9,228	54,307
57	Potatoes	bu.	270,942	7,374	132	7	1,084	5,058
	Sub-total—Vegetables	....	.....	68,345	9,535	573	27,361	156,696
	Saccharine Materials							
58	Honey	gal.	285,000	1,551	6	.....	1,260	5,198
59	Molasses	gal.	94,047,347	469,256	.....	.....	305,015	1,250,736
60	Beet sugar	lb.	877,623	398	.....	.....	398	1,632
61	Cane sugar	lb.	6,778,227,612	3,074,570	.....	.....	3,074,570	12,607,563
62	Maple sugar and syrup	lb.	1,473,762	668	.....	.....	514	2,115
	Sub-total—Sugars	....	.....	3,546,443	6	.....	3,381,757	13,867,184
	Fruits							
63	Bananas	lb.	2,231,373,366	1,012,144	8,097	4,049	129,554	602,471
64	Currants	lb.	30,350,527	13,767	330	248	10,215	45,374
65	Dates	lb.	24,949,374	11,317	204	294	7,990	36,177
66	Figs	lb.	20,778,730	9,426	396	19	6,994	30,650
67	Raisins	lb.	2,808,806	1,274	28	38	874	4,059
68	Olives	gal.	3,622,275	13,309	105	2,688	1,130	30,076
69	Oranges	lb.	167,000	76	.....	.....	5	26
	Sub-total—Fruits	....	.....	1,061,313	9,160	7,336	156,762	748,833
	Vegetable Oils and Nuts							
70	Almonds	lb.	17,111,264	7,762	1,416	3,717	1,166	45,131
71	Filberts	lb.	13,690,562	6,210	533	2,254	445	24,947
72	Peanuts	lb.	24,184,673	10,970	2,421	4,115	1,781	55,466
73	Walnuts	lb.	33,445,838	15,171	1,413	5,008	1,000	56,424
74	Cocoanut, shredded	lb.	5,936,212	2,693	167	1,546	851	18,551
75	Cream and Brazil nuts	lb.	16,272,581	7,381	635	2,495	251	26,931
76	Chinese nut oil	gal.	4,946,330	17,255	.....	16,916	.....	157,320
77	Edible olive oil	gal.	6,710,967	23,439	.....	22,970	.....	213,704
78	Cocoanut oil	lb.	63,135,428	28,638	.....	28,065	.....	261,128
79	Cottonseed oil	lb.	15,162,361	6,878	.....	6,740	.....	62,712
80	Cacao, crude	lb.	192,306,634	87,230	11,340	35,415	22,156	466,344
81	Cocoa and chocolate, manufactured	lb.	2,427,561	1,101	190	427	375	6,287
	Sub-total—Oils and Nuts	....	.....	214,728	18,115	129,662	28,025	1,394,939
	Fish							
82	Cured fish	lb.	159,621,520	72,404	12,309	3,910	.....	86,834
83	Fresh fish	lb.	46,650,007	21,160	3,640	804	.....	23,185
84	Crab meat	lb.	2,300,826	1,044	165	16	6	851
85	Lobster	lb.	8,845,207	4,012	367	28	13	1,811
	Sub-total—Fish	....	.....	98,620	16,481	4,758	19	112,681
	Grand Total—All Primary Food Imports	....	.....	5,143,853	66,952	142,950	3,711,608	16,825,791

TABLE 28.—*Continued*

Reference No.	Commodity	Original units	1915–16 Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	21,789,602	9,884	1,206	99	7,334	35,953
50	Rice	lb.	178,783,954	81,096	6,487	162	64,066	291,597
51	Rice flour	lb.	55,628,767	25,233	2,018	51	19,934	90,731
52	Wheat	bu.	5,703,078	155,214	12,847	1,128	84,627	410,194
53	Wheat flour	bbl.	329,905	29,330	3,344	293	22,026	106,763
	Sub-total—Grains	....	.....	300,757	25,902	1,733	197,987	935,238
	Vegetables							
54	Beans and lentils	bu.	662,759	18,038	3,986	259	11,105	64,288
55	Onions	bu.	845,872	21,094	290	62	1,844	8,331
56	Peas, dried	bu.	940,321	25,592	6,296	256	15,867	93,374
57	Potatoes	bu.	209,532	5,703	102	5	838	3,911
	Sub-total—Vegetables	....	.....	70,427	10,674	582	29,654	170,904
	Saccharine Materials							
58	Honey	gal.	350,000	1,905	7	...	1,547	6,384
59	Molasses	gal.	110,394,760	550,822	.....	...	358,033	1,468,140
60	Beet sugar	lb.	2,050	1	.....	...	1	4
61	Cane sugar	lb.	7,084,922,359	3,213,685	.....	.....	3,213,685	13,177,956
62	Maple sugar and syrup	lb.	1,886,933	856	.....	.....	659	2,708
	Sub-total—Sugars	....	.....	3,767,269	7	.....	3,573,925	14,655,192
	Fruits							
63	Bananas	lb.	2,000,948,940	907,624	7,261	3,631	116,176	540,256
64	Currants	lb.	25,373,029	11,509	276	207	8 539	37,933
65	Dates	lb.	31,075,424	14,096	254	366	9,952	45,059
66	Figs	lb.	7,153,250	3,245	136	6	2,408	10,551
67	Raisins	lb.	1,024,296	465	10	14	318	1,480
68	Olives	gal.	5,938,446	21,819	172	4,407	1,853	49,307
69	Oranges	lb.	298,000	135	1	.....	10	46
	Sub-total—Fruits	....	.....	958,893	8,110	8,631	139,256	684,632
	Vegetable Oils and Nuts							
70	Almonds	lb.	16,596,921	7,528	1,453	3,811	1,194	46,275
71	Filberts	lb.	10,919,460	4,953	408	1,730	342	19,143
72	Peanuts	lb.	28,413,680	12,888	3,072	5,228	2,261	70,479
73	Walnuts	lb.	36,858,934	16,719	1,680	5,943	1,188	66,983
74	Cocoanut, shredded	lb.	8,491,069	3,852	239	2,211	1,217	26,535
75	Cream and Brazil nuts	lb.	14,798,912	6,713	577	2,269	229	24,492
76	Chinese nut oil	gal.	4,968,262	17,353	.....	17,005	.....	158,209
77	Edible olive oil	gal.	7,224,431	25,233	.....	24,728	.....	236,655
78	Cocoanut oil	lb.	66,607,560	29,941	.....	29,342	.....	273,007
79	Cottonseed oil	lb.	17,180,542	7,793	.....	7,637	.....	71,059
80	Cacao, crude	lb.	243,231,939	110,329	14,343	44,793	28,023	589,837
81	Cocoa and chocolate, manufactured	lb.	2,347,162	1,065	183	413	362	6,079
	Sub-total—Oils and Nuts	....	.....	244,367	21,955	145,110	34,816	1,582,153
	Fish							
82	Cured fish	lb.	152,474,573	69,162	11,757	3,735	.....	82,946
83	Fresh fish	lb.	54,352,654	24,654	4,240	937	.....	27,013
84	Crab meat	lb.	2,956,676	1,341	212	22	8	1,694
85	Lobster	lb.	8,817,950	4,000	353	27	12	1,745
	Sub-total—Fish	....	.....	99,157	16,562	4,721	20	112,798
	Grand Total—All Primary Food Imports	....	.....	5,440,870	83,210	160,777	3,975,658	18,140,924

TABLE 28—*Continued*

Reference No.	Commodity	Original units	1916–17 Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	3,472,503	1,575	192	15	1,168	5,730
50	Rice	lb.	150,836,314	68,419	5,473	137	54,056	246,014
51	Rice flour	lb.	37,730,024	17,114	1,369	34	13,520	61,538
52	Wheat	bu.	24,138,817	656,958	54,374	4,774	358,194	1,736,184
53	Wheat flour	bbl.	174,704	15,532	1,771	155	11,665	56,537
	Sub-total—Grains	....	.....	759,598	63,179	5,115	438,597	2,106,003
	Vegetables							
54	Beans and lentils	bu.	3,747,993	102,005	22,543	1,462	62,800	363,555
55	Onions	bu.	1,757,948	45,452	625	134	3,974	20,106
56	Peas, dried	bu.	1,163,021	31,653	7,786	317	19,624	115,488
57	Potatoes	bu.	3,079,025	83,799	1,509	83	12,319	57,476
	Sub-total—Vegetables	....	.....	262,909	32,463	1,996	98,717	556,625
	Saccharine Materials							
58	Honey	gal.	394,000	2,145	8	.....	1,742	7,187
59	Molasses	gal.	139,968,483	698,382	.....	.....	453,946	1,861,441
60	Beet sugar	lb.	28,847	13	.....	.....	13	54
61	Cane sugar	lb.	6,946,760,483	3,150,988	.....	.....	3,150,988	12,920,863
62	Maple sugar and syrup	lb.	3,129,647	1,420	.....	.....	1,093	4,491
	Sub-total—Sugars	....	.....	3,852,948	8	.....	3,607,782	14,794,036
	Fruits							
63	Bananas	lb.	1,885,583,664	855,295	6,842	3,421	109,477	509,108
64	Currants	lb.	10,476,534	4,752	114	85	3,526	15,662
65	Dates	lb.	25,485,361	11,560	208	300	8,161	36,954
66	Figs	lb.	16,479,733	7,475	314	14	5,546	24,308
67	Raisins	lb.	1,850,219	839	18	25	576	2,674
68	Olives	gal.	5,641,759	20,729	164	4,187	1,761	46,844
69	Oranges	lb.	357,000	162	1	.....	13	55
	Sub-total—Fruits	....	.....	900,812	7,661	8,032	129,060	635,605
	Vegetable Oils and Nuts							
70	Almonds	lb.	23,424,058	10,625	2,013	5,281	1,656	64,110
71	Filberts	lb.	13,240,033	6,006	522	2,203	436	24,384
72	Peanuts	lb.	34,986,760	15,870	3,874	6,601	2,852	88,962
73	Walnuts	lb.	38,725,362	17,566	1,648	5,840	1,166	65,808
74	Cocoanut, shredded	lb.	9,743,024	4,419	274	2,537	1,396	30,447
75	Cream and Brazil nuts	lb.	14,627,742	6,635	571	2,243	226	24,269
76	Chinese nut oil	gal.	6,864,110	23,974	.....	23,494	.....	218,581
77	Edible olive oil	gal.	7,533,149	26,311	.....	25,785	.....	239,886
78	Cocoanut oil	lb.	79,223,398	35,935	.....	35,216	.....	327,668
79	Cottonseed oil	lb.	13,703,126	6,216	.....	6,092	.....	56,676
80	Cacao, crude	lb.	338,653,876	153,612	19,970	62,367	39,017	821,236
81	Cocoa and chocolate, manufactured	lb.	1,829,521	830	142	322	282	4,738
	Sub-total—Oils and Nuts	....	.....	307,999	29,014	177,981	47,031	1,966,705
	Fish							
82	Cured fish	lb.	166,040,558	75,315	12,803	4,067	.....	90,326
83	Fresh fish	lb.	59,906,407	27,173	4,674	1,032	.....	29,773
84	Crab meat	lb.	4,000,608	1,815	287	29	11	1,480
85	Lobster	lb.	7,945,441	3,604	361	26	12	1,766
	Sub-total—Fish	....	.....	107,907	18,125	5,154	23	123,345
	Grand Total—All Primary Food Imports	....	.....	6,192,173	150,450	198,278	4,321,210	20,182,319

TABLE 28—*Continued*

Reference No.	Commodity	Original units	1917–18 Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
49	Macaroni	lb.	669,524	304	37	3	225	1,105
50	Rice	lb.	385,280,564	174,762	13,979	349	138,062	628,393
51	Rice flour	lb	48,064,650	21,802	1,745	44	17,224	78,393
52	Wheat	bu	28,157,289	766,324	63,426	5,568	417,824	2,025,213
53	Wheat flour	bbl.	675,096	60,019	6,842	601	45,075	218,472
	Sub-total—Grains		.....	1,023,211	86,029	6,565	618,410	2,951,576
	Vegetables							
54	Beans and lentils	bu.	4,145,625	112,827	24,934	1,618	69,464	402,126
55	Onions	bu.	1,315,402	34,010	468	100	2,974	15,044
56	Peas, dried	bu.	2,068,054	56,284	13,846	562	34,896	205,358
57	Potatoes	bu.	1,115,000	30,346	546	30	4,461	20,814
	Sub-total—Vegetables		.....	233,467	39,794	2,310	111,795	643,342
	Saccharine Materials							
58	Honey	gal.	606,600	3,299	14	.....	2,678	11,053
59	Molasses	gal.	159,898,090	797,822	.....	.....	518,582	2,126,485
60	Beet sugar	lb	750	.	...	.	.	1
61	Cane sugar	lb.	6,186,474,712	2,806,154	.....	.....	2,806,154	11,506,843
62	Maple sugar and syrup	lb.	5,501,438	2,495	.....	.....	1,921	7,895
	Sub-total—Sugars		.....	3,609,770	14	.....	3,329,335	13,652,277
	Fruits							
63	Bananas	lb.	1,873,213,674	849,684	6,798	3,398	108,759	505,768
64	Currants	lb.	5,168,070	2,344	56	43	1,739	7,726
65	Dates	lb.	5,572,908	2,528	45	65	1,784	8,081
66	Figs	lb.	10,473,219	4,751	200	9	3,525	15,448
67	Raisins	lb.	843,533	383	8	12	262	1,219
68	Olives	gal.	2,160,059	7,936	63	1,603	674	17,935
69	Oranges	lb.	107,000	49	.....	.....	4	16
	Sub-total—Fruits		.....	867,675	7,170	5,130	116,747	556,193
	Vegetable Oils and Nuts							
70	Almonds	lb.	23,840,145	10,814	2,085	5,466	1,712	66,373
71	Filberts	lb.	20,646,786	9,365	816	3,446	681	38,144
72	Peanuts	lb.	76,512,962	34,706	8,866	15,117	6,528	203,740
73	Walnuts	lb.	23,289,170	10,564	1,195	4,217	845	47,552
74	Cocoanut, shredded	lb.	20,579,973	9,335	579	5,358	2,956	64,312
75	Cream and Brazil nuts	lb.	30,439,095	13,807	1,188	4,667	469	50,377
76	Chinese nut oil	gal.	4,815,740	16,820	.....	16,484	.....	153,352
77	Edible olive oil	gal.	2,537,513	8,863	.....	8,685	.....	80,805
78	Cocoanut oil	lb.	259,196,853	117,571	.....	115,219	.....	1,072,038
79	Cottonseed oil	lb.	14,087,313	6,390	.....	6,262	.....	58,265
80	Cacao, crude	lb.	399,040,401	181,604	23,531	73,487	45,975	967,673
81	Cocoa and chocolate, manufactured	lb.	271,877	123	21	48	42	704
	Sub-total—Oils and Nuts		.....	419,362	38,281	258,456	59,202	2,803,335
	Fish							
82	Cured fish	lb.	179,221,211	81,294	13,820	4,390	.....	97,496
83	Fresh fish	lb.	60,889,332	27,619	4,750	1,050	.....	30,262
84	Crab meat	lb.	4,860,377	2,205	348	35	14	1,798
85	Lobster	lb.	7,124,683	3,232	328	24	11	1,603
	Sub-total—Fish		.....	114,350	19,246	5,499	25	131,159
	Grand Total—All Primary Food Imports		.....	6,267,835	190,534	277,960	4,235,514	20,737,882

The totals for the successive year from Table 28 are exhibited in Table 29, which is arranged on the same plan as Table 8 of Chapter III.

TABLE 29.—SUMMARY OF GROSS IMPORTS OF PRIMARY FOODS

(Metric Tons)

Year	Total gross imports of primary foods	Protein in gross imports	Fat in gross imports	Carbohydrate in gross imports	Calories (millions) in gross imports
1911-12	4,831,174	76,069	114,963	3,112,586	14,146,115
1912-13	4,635,987	67,078	118,517	3,297,123	14,899,054
1913-14	5,257,320	87,343	153,481	3,557,328	16,374,832
1914-15	5,143,853	66,952	142,950	3,711,608	16,825,791
1915-16	5,440,870	83,210	160,777	3,975,658	18,140,924
1916-17	6,192,173	150,450	198,278	4,321,210	20,182,319
1917-18	6,267,835	190,534	277,960	4,235,511	20,737,882
Total for 7 years	37,769,212	721,636	1,166,926	26,211,027	121,306,917
Average per year, whole period	5,395,601	103,091	166,704	3,744,432	17,329,560
Average per year, prewar	4,908,160	76,830	128,987	3,322,346	15,140,000
Average per year, war period	5,761,183	122,786	194,991	4,060,997	18,971,729
Per cent. nutrient to total (whole period) and calories per lb.	.....	1.9	3.1	69.4	1456.9

The first noticeable feature of the summarized import data is the course of events in successive years. It is plain that throughout the seven years covered here there has been a steady increase in food imports. This increase has been relatively most marked in protein and fat. The precise character of these yearly changes is most clearly to be seen from Fig. 12.

The dominant position of sugar in our food imports is apparent. The carbohydrate line ascends steadily alongside the total line, but without showing the fluctuations of the latter. The fat and protein imports are insignificant as compared with the carbohydrate.

Comparing the prewar averages with those for the war years it is seen that the total gross primary food imports were 17.4 per cent. greater in the war period than prewar; the protein imports were 59.8 per cent. greater; the fat imports were 51.2 per cent. greater; the carbohydrate imports were 22.2 per cent. greater; and the calory content of the gross primary food imports was 25.3 per cent. greater in the war period. These are all notable increases. They indicate first the negligibly small effect of the German submarine campaign on our food imports, and second the fact that high prices in the United States in the war period greatly stimulated the imports of primary foodstuffs.

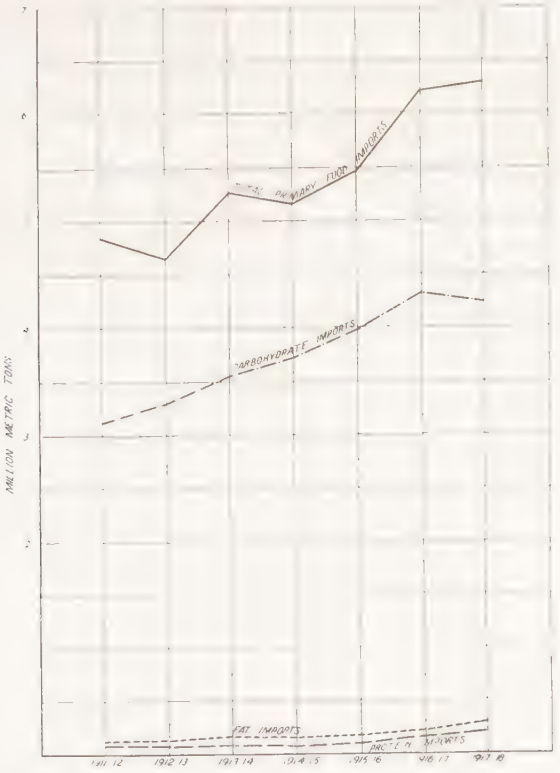

FIG. 12.—Showing the course of gross imports of primary food materials since 1911. Solid line denotes total primary food imports. Dash line, protein content of imported primary foods; dot line, fat content of imported primary foods; dash-dot line, carbohydrate content.

TABLE 30.—PERCENTAGES WHICH GROSS IMPORTS OF PRIMARY FOODS ARE OF DOMESTIC PRODUCTION OF PRIMARY FOODS

Year	Total imports	Protein	Fat	Carbohydrate	Calories
1911–12	15.0	4.4	12.2	23.7	20.3
1912–13	12.2	3.3	12.9	22.0	19.1
1913–14	14.7	4.3	16.2	23.5	20.7
1914–15	12.1	2.9	13.1	21.8	18.8
1915–16	12.2	3.2	17.4	20.9	18.6
1916–17	18.7	8.5	21.4	31.6	28.0
1917–18	17.0	9.7	27.2	28.5	26.4
Whole period	14.4	5.0	17.2	24.3	21.5
Prewar period	13.9	4.0	13.7	23.1	20.0
War period	14.8	5.6	19.7	25.1	22.5

It is a matter of great interest to see what proportion of our total primary food production the gross primary food imports form. In order to show this Table 30 has been prepared.

The data of Table 30 are shown graphically in Fig. 13.

The percentages of Table 30 are higher than would have been expected generally. We are accustomed to think of the United States as a food exporting country, which in a broad way it is.

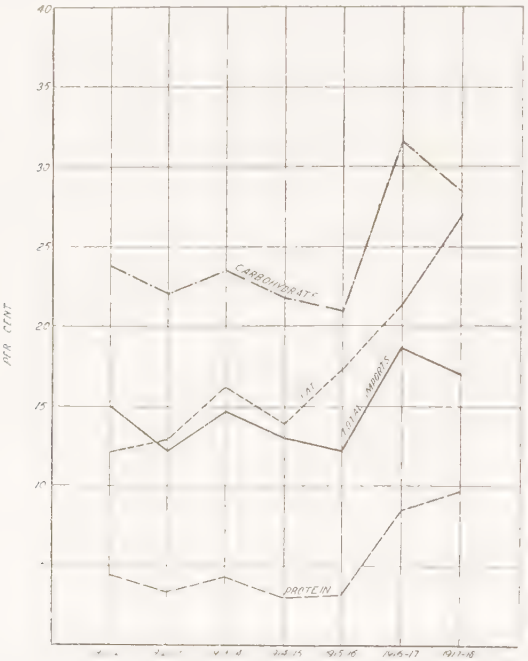

Fig. 13.—Showing the percentages which total primary food imports are of total domestic production of primary foods. Solid line, total imports and total productions; dash line, protein; dot line, fat; dash-dot line, carbohydrate.

But this does not mean that it imports only insignificant quantities of food materials. Taking the three year prewar period the gross primary food imports were in total 13.9 per cent. of the total domestic production of primary foods. Or put in another way, of the total normal primary human food resources of the country, from which must come domestic consumption and export, about one pound was imported for every seven produced here. Substantially the same thing was true of fat in primary foods.

In the case of protein the prewar average gross primary imports were just 4 per cent. of our domestic production of protein in primary foods. The carbohydrate percentage is 23. This means that in the total carbohydrate resources of the country in the form of human foods approximately one pound was imported, for every four pounds domestically produced. These percentages greatly increased in the war period, as the last line of the table shows. In 1917–18, chiefly because of the falling off in sugar imports, the percentages for gross total, carbohydrate and calories fell off slightly. The protein and fat percentages were, however, higher.

Another matter of considerable interest is the weighted average analysis, as given in the last line of Table 29, of imported primary foods as compared with domestically produced primary foods. By comparing these figures with those given in Table 8 (Chapter III) it is seen that the imported foods contain less than half as much protein as the domestically produced. They are, however, richer in fat and carbohydrate, especially the latter. This of course arises from the tremendous relative weight of sugar in our primary food imports. If one were to consider the other primary food imports alone, leaving out the sugars, it would be found, as would be expected *a priori*, that the imports are much richer in protein and fat than the domestic production of the same food. Overseas trade in food naturally tends toward concentrated forms of nutriment.

We will now turn to a consideration of the gross imports of secondary human foods. The basic data are shown in Table 32. The conversion factors are given in Table 31. The data came from the reports of the Bureau of Foreign and Domestic Commerce, of the Department of Commerce. The general plan followed has been as in the case of primary food imports. No deductions are made at this point. Whatever deduction may be necessary will be made in connection with the consumption tables in a later chapter. "As purchased" analyses, which allow for inedible refuse as explained earlier (cf. p. 33 *supra*), are used throughout.

MEATS AND DERIVATIVE PRODUCTS

86. Beef and Veal.—These meats are given as one item in the import statistics of the Department of Commerce, and it is therefore impossible to separate them here. It is probable, however, that the veal constitutes only a very small fraction of the total under this rubric. Accordingly we have felt justified in using factors for

beef in calculating the nutrients. The same factors were used as for the item Beef in Chapter IV. (Reference No. 36.)

87. Mutton and Lamb.—Here again the factors for mutton (Reference No. 42) were used in calculating the nutrients, on the assumption that the great bulk of the imports fell into that category, and because of the impossibility of separating the imports.

88. Fresh Pork.—Here a different set of factors was used for calculating nutrients than in the case of domestic production, for the reason that in the production figures lard was included with the fresh pork. In the imports this would not be the case. As a matter of fact, a study of imported and exported meats indicated that the fairest factors to use in calculating nutrients for these items would be Atwater and Bryant's figures for medium fat loins. Accordingly that plan has been adopted for the imports.

89. Bacon and Hams.—The factors used for calculating nutrients were derived by first taking an unweighted average of Atwater and Bryant's figures for "Ham, smoked, all analyses" and "Shoulders, smoked, all analyses," and then taking an average of these figures and "Bacon, smoked, all analyses." This assumes an equal representation of bacon, hams and shoulders in the imports. This may or may not be correct, but even if it is not, any weighting to allow for difference in the import of the three commodities, would practically make very little difference in the final factors. This must clearly be so because of the general similarity of the analyses of these products.

90. Bologna Sausage.—Analytical figures were taken from Atwater and Bryant.

91. Oleo Stearin.—This material is taken as 100 per cent. fat.

POULTRY AND EGGS

92. Eggs, Whole.—The same analytical factors are used as in production statistics. (Reference No. 47.)

93. Eggs, Dried, Frozen, etc.—Here we are dealing with a group of egg products largely used by manufacturing bakers, etc. It being impossible to get any absolutely exact analytical figures for such a mixture the Atwater and Bryant factors for the edible portion only of fresh eggs have been used. This is as close an approximation as it seems possible to make. It would be rather seriously inaccurate if dried eggs formed any considerable proportion of the total, but we understand that such is not the case.

DAIRY PRODUCTS

94. Butter.—In the import statistics of the Department of Commerce butter substitutes are included with butter. No allowance can be made for this in the nutrient factors because of lack of data. Consequently we have used Atwater and Bryant's figures for butter.

95. Cheese.—This item in the imports includes "cheese and substitutes for." The "substitutes" must, however, be a very small fraction of the total. We have used Atwater and Bryant's figures for "cheese, full cream, as purchased" in calculating nutrient factors.

96. Cream.—Nutrient factors calculated from Atwater and Bryant's "Cream as purchased," analysis.

97. Milk.—This import item is given in the reports of the Department of Commerce only in terms of money value, and includes both fresh and condensed milk. The figures set down in Table 32 under this item are estimates of the whole fresh milk equivalent of this importation. Estimating the matter in this way gets over some difficulties in calculating nutrient values and probably leads to a more accurate final result than could be reached by attempting to deal with the condensed milk fraction of the total import separately.

TABLE 31.—FACTORS BY WHICH AMOUNTS, IN ORIGINAL UNITS, OF IMPORTED SECONDARY FOOD COMMODITIES ARE TO BE MULTIPLIED TO GET SHORT TONS OF NUTRIENTS

Commodity reference No.	Commodity	Original unit of measure	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
86	Beef and veal	lb.	0.000076	0.000077	0	0.000935
87	Mutton and lamb	lb.	0.000065	0.000120	0	0.001255
88	Fresh pork	lb.	0.000067	0.000121	0	0.001270
89	Bacon and hams	lb.	0.000057	0.000231	0	0.002165
90	Bologna sausage	lb.	0.000091	0.000099	0	0.001170
91	Oleo stearin	lb.	0	0.000500	0	0.004220
92	Eggs, whole	doz.	0.000098	0.000070	0	0.000953
93	Eggs, dried, frozen, etc.	lb.	0.000074	0.000053	0	0.000720
94	Butter	lb.	0.000005	0.000425	0	0.003605
95	Cheese	lb.	0.000129	0.000169	0.000012	0.001950
96	Cream	gal.	0.000105	0.000773	0.000188	0.007608
97	Milk	lb.	0.000019	0.000018	0.000023	0.000308

TABLE 32.—SHOWING THE GROSS IMPORTS OF SECONDARY FOODS INTO THE UNITED STATES, 1911–12 TO 1917–18, INCLUSIVE

Reference No.	Commodity	Original units	1911–12					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	2,000,000	907	138	140	0	1,870
87	Mutton and lamb	lb.	750,000	340	44	82	0	941
88	Fresh pork	lb.	500,000	227	30	55	0	635
89	Bacon and hams	lb.	0	0	0	0	0	0
90	Bologna sausage	lb.	971,775	441	80	87	0	1,137
91	Oleo stearin	lb.	4,913,090	2,229	0	2,229	0	20,733
	Sub-total—Meats	...	.....	4,144	292	2,593	0	25,316
	Poultry and Eggs							
92	Eggs, whole	doz.	973,053	662	86	62	0	927
93	Eggs, dried, frozen, etc	lb.	43,822	20	3	2	0	32
	Sub-total—Poultry	...	.....	682	89	64	0	959
	Dairy Products							
94	Butter	lb.	1,025,668	465	5	395	0	3,698
95	Cheese	lb.	46,542,007	21,111	5,447	7,136	507	90,757
96	Cream	gal.	1,120,427	4,371	107	786	191	8,524
97	Milk	lb.	3,004,000	1,363	52	49	63	925
	Sub-total—Dairy Products	...	.....	27,310	5,611	8,366	761	103,904
	Grand Total—All Secondary Food Imports	...	.....	32,136	5,992	11,023	761	130,179

TABLE 32—*Continued*

Reference No.	Commodity	Original units	1912–13					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	15,000,000	6,804	1,034	1,048	0	14,025
87	Mutton and lamb	lb.	2,000,000	907	118	218	0	2,510
88	Fresh pork	lb.	1,000,000	454	61	110	0	1,270
89	Bacon and hams	lb.	0	0	0	0	0	0
90	Bologna sausage	lb.	728,469	330	60	65	0	852
91	Oleo stearin	lb.	9,511,134	4,315	0	4,315	0	40,137
	Sub-total—Meats	...	.....	12,810	1,273	5,756	0	58,794
	Poultry and Eggs							
92	Eggs, whole	doz.	1,367,224	930	122	87	0	1,303
93	Eggs, dried, frozen, etc	lb.	228,305	104	15	11	0	164
	Sub-total—Poultry	...	.....	1,034	137	98	0	1,467
	Dairy Products							
94	Butter	lb.	1,162,253	527	5	448	0	4,190
95	Cheese	lb.	49,387,944	22,402	5,780	7,572	538	96,306
96	Cream	gal.	1,247,083	4,865	119	875	212	9,488
97	Milk	lb.	6,500,000	2,948	112	106	135	2,002
	Sub-total—Dairy Products	...	.....	30,742	6,016	9,001	885	111,986
	Grand Total—All Secondary Food Imports	...	.....	44,856	7,426	14,855	885	172,247

TABLE 32—*Continued*

Reference No.	Commodity	Original units	1913–14					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	180,137,183	81,710	12,419	12,584	0	168,428
87	Mutton and lamb	lb.	12,710,905	5,766	749	1,383	0	15,952
88	Fresh pork	lb.	4,624,799	2,098	281	508	0	5,873
89	Bacon and hams	lb.	2,008,960	911	104	421	0	4,349
90	Bologna sausage	lb.	730,326	331	60	65	0	854
91	Oleo stearin	lb.	5,243,553	2,379	0	2,379	0	22,128
	Sub-total—Meats	...	.....	93,195	13,613	17,340	0	217,584
	Poultry and Eggs							
92	Eggs, whole	doz.	6,014,955	4,093	534	382	0	5,732
93	Eggs, dried, frozen, etc	lb.	3,420,412	1,551	230	164	0	2,463
	Sub-total—Poultry	...	.....	5,644	764	546	0	8,195
	Dairy Products							
94	Butter	lb.	7,842,022	3,557	35	3,024	0	28,270
95	Cheese	lb.	63,784,313	28,932	7,464	9,780	694	124,379
96	Cream	gal.	1,773,152	6,917	169	1,244	302	13,490
97	Milk	lb.	52,180,000	23,669	899	852	1,089	16,071
	Sub-total—Dairy Products	...	.....	63,075	8,567	14,900	2,085	182,210
	Grand Total—All Secondary Food Imports	...	.....	161,914	22,944	32,786	2,085	407,989

TABLE 32 —*Continued*

Reference No.	Commodity	Original units	1914–15					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	184,490,759	83,684	12,720	12,887	0	172,499
87	Mutton and lamb	lb.	15,528,855	7,044	915	1,690	0	19,489
88	Fresh pork	lb.	16,250,514	7,371	988	1,783	0	20,638
89	Bacon and hams	lb.	7,542,446	3,421	390	1,580	0	16,329
90	Bologna sausage	lb.	209,484	95	17	19	0	245
91	Oleo stearin	lb.	2,424,009	1,100	0	1,100	0	10,229
	Sub-total—Meats	...	.....	102,715	15,030	19,059	0	239,429
	Poultry and Eggs							
92	Eggs, whole	doz.	3,046,631	2,073	271	193	0	2,903
93	Eggs, dried, frozen, etc	lb.	8,571,758	3,888	575	412	0	6,172
	Sub-total—Poultry	...	.....	5,961	846	605	0	9,075
	Dairy Products							
94	Butter	lb.	3,828,227	1,736	17	1,476	0	13,801
95	Cheese	lb.	50,138,520	22,743	5,868	7,687	546	97,770
96	Cream	gal.	2,077,384	8,104	198	1,457	355	15,805
97	Milk	lb.	119,640,000	54,268	2,062	1,954	2,497	36,849
	Sub-total —Dairy Products	...	.....	86,851	8,145	12,574	3,398	164,225
	Grand Total—All Secondary Food Imports	...	.....	195,527	24,021	32,238	3,398	412,729

TABLE 32—*Continued*

Reference No.	Commodity	Original units	1915–16					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	71,101,756	32,252	4,902	4,967	0	66,480
87	Mutton and lamb	lb.	20,257,999	9,189	1,195	2,205	0	25,424
88	Fresh pork	lb.	2,169,084	984	131	238	0	2,755
89	Bacon and hams	lb.	667,667	303	34	140	0	1,445
90	Bologna sausage	lb.	47,287	21	4	4	0	55
91	Oleo stearin	lb.	910,478	413	0	413	0	3,842
	Sub-total Meats	...	.....	43,162	6,266	7,967	0	100,001
	Poultry and Eggs							
92	Eggs, whole	doz	732,566	498	65	46	0	698
93	Eggs, dried, frozen, etc	lb.	6,021,672	2,731	405	289	0	4,336
	Sub-total—Poultry	...	.....	3,229	470	335	0	5,034
	Dairy Products							
94	Butter	lb.	712,998	323	4	275	0	2,570
95	Cheese	lb.	30,087,999	13,648	3,521	4,613	327	58,672
96	Cream	gal.	1,193,745	4,657	113	837	203	9,082
97	Milk	lb.	72,670,000	32,963	1,253	1,187	1,516	22,382
	Sub-total—Dairy Products	...	.....	51,591	4,891	6,912	2,046	92,706
	Grand Total—All Secondary Food Imports	.....	.....	97,982	11,627	15,214	2,046	197,741

TABLE 32—*Continued*

Reference No.	Commodity	Original units	1916–17					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	15,217,118	6,902	1,050	1,063	0	14,228
87	Mutton and lamb	lb.	4,684,131	2,125	276	510	0	5,879
88	Fresh pork	lb.	1,651,227	749	101	181	0	2,097
89	Bacon and hams	lb.	190,293	86	10	40	0	412
90	Bologna sausage	lb.	682	03	.....	.....	0	1
91	Oleo stearin	lb.	1,113,277	505	0	505	0	4,698
	Sub-total—Meats	...	.....	10,367	1,437	2,299	0	27,315
	Poultry and Eggs							
92	Eggs, whole	doz.	1,110,322	755	99	71	0	1,058
93	Eggs, dried, frozen, etc	lb.	10,317,774	4,680	693	496	0	7,429
	Sub-total—Poultry	...	.....	5,435	792	567	0	8,487
	Dairy Products							
94	Butter	lb.	523,573	237	3	202	0	1,887
95	Cheese	lb.	14,481,514	6,569	1,695	2,220	158	28,239
96	Cream	gal.	743,819	2,902	71	522	127	5,659
97	Milk	lb.	85,925,000	38,975	1,481	1,403	1,793	26,465
	Sub-total—Dairy Products	...	.....	48,683	3,250	4,347	2,078	62,250
	Grand Total—All Secondary Food Imports			64,485	5,479	7,213	2,078	98,052

TABLE 32—*Continued*

Reference No.	Commodity	Original units	1917–18					
			Gross imports in original units	Gross imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
86	Beef and veal	lb.	25,451,655	11,545	1,755	1,778	0	23,797
87	Mutton and lamb	lb.	2,007,601	911	118	219	0	2,520
88	Fresh pork	lb.	1,847,731	838	112	203	0	2,347
89	Bacon and hams	lb.	260,031	118	14	54	0	563
90	Bologna sausage	lb.	15,056	7	1	1	0	18
91	Oleo stearin	lb.	6,575,369	2,983	0	2,983	0	27,748
	Sub-total—Meats	...	.....	16,402	2,000	5,238	0	56,993
	Poultry and Eggs							
92	Eggs, whole	doz.	1,606,755	1,093	142	102	0	1,531
93	Eggs, dried, frozen, etc	lb.	14,668,619	6,654	984	705	0	10,561
	Sub-total—Poultry	...	.....	7,747	1,126	807	0	12,092
	Dairy Products							
94	Butter	lb.	1,968,354	893	9	759	0	7,096
95	Cheese	lb.	9,839,305	4,463	1,151	1,509	107	19,187
96	Cream	gal.	711,502	323	68	499	122	5,413
97	Milk	lb.	135,627,000	61,520	2,338	2,214	2,830	41,773
	Sub-total—Dairy Products	...	.....	67,199	3,566	4,981	3,059	73,469
	Grand Total—All Secondary Food Imports	..	..	91,348	6,692	11,026	3,059	142,554

The results of Table 32 are summarized in Table 33, which shows the yearly changes in gross imports of secondary foods.

TABLE 33.—SUMMARY OF GROSS IMPORTS OF SECONDARY FOODS

(Metric Tons)

Year	Total gross imports of secondary foods	Protein in gross imports	Fat in gross imports	Carbohydrate in gross imports	Calories (millions) in gross imports
1911–12	32,136	5,992	11,023	761	130,179
1912–13	44,586	7,426	14,855	885	172,247
1913–14	161,914	22,944	32,786	2,085	407,989
1914–15	195,527	24,021	32,238	3,398	412,729
1915–16	97,982	11,627	15,214	2,046	197,741
1916–17	64,485	5,479	7,213	2,078	98,052
1917–18	91,348	6,692	11,026	3,059	142,554
Total for 7 years	687,978	84,181	124,355	14,312	1,561,491
Average per year, whole period	98,283	12,026	17,765	2,045	223,070
Average per year, prewar	79,545	12,121	19,555	1,244	236,805
Average per year, war period	112,335	11,955	16,423	2,645	212,769
Per cent. nutrients to total (whole period) and calories per lb	.....	12.2	18.1	2.1	102.9

The first thing which strikes one in connection with this table is that secondary food imports are of extremely little significance in the nutrition of the nation. In terms of gross commodity the secondary food imports in the whole period of seven years here covered were only 0.19 per cent. of the domestic production of secondary foods. Comparing in the same way the total of Table 32 with those of Table 12 (Chapter IV) for productions of secondary foods, we find the imported protein in 0.60 per cent. of domestic production; while for carbohydrate and calories the percentages are respectively 0.22 and 0.39. From these figures it is evident enough that the whole secondary food importation into the United States might be cut off absolutely, and from a nutritional point of view the population would never know that anything had happened. The contrast between the primary and the secondary foods in respect to their importation is striking. It would make a great difference

in the nutritional welfare of this country if our primary food imports for any reason stopped.

The secondary food imports are so small and unimportant in relation to the total that no special significance attaches to the yearly fluctuations in the amount of such imports. In general these imports increased to 1914–15, then fell off greatly in the next two years and revived a little last year.

A noteworthy feature of the secondary food imports is the very different weighted average composition which they show in comparison with the domestic production of the same class of foodstuffs. Such a comparison is afforded by the last lines of Tables 33 and 12 (Chapter IV). The protein content of the imported secondary foods is about 3 times higher than that of the domestic production and the fat and calory contents are each about twice as high. The difference seems largely traceable to the fact that all the nutrients of milk appear in the imports, while deductions were properly made in the domestic production of dairy products, and to the different relative contributions of the several commodities to the totals in the two cases.

CHAPTER VII

GROSS EXPORTS OF PRIMARY AND SECONDARY FOODS

(Commodity Reference Nos. 98–151)

We come now to the consideration of the last element necessary to a calculation of consumption, namely exports. The United States is, broadly speaking, a great food exporting nation. This phase of the general problem of making a nutritional balance sheet has, on this account, especial interest for us.

The general plan in dealing with exports will be the same as that of the earlier chapters, with some differences arising out of the form in which the basic statistics are available in the reports of the Department of Commerce. The export statistics of the United States in the strict sense of the word, are reported in two categories, namely; first, exports of domestic merchandise, meaning materials which either originate in this country or have been so manipulated as to enhance their value by processes of manufacture; and, second, exports of foreign merchandise, meaning the export of previously imported materials. There is still a third class of shipments out of the United States, namely those to our non-contiguous possessions, Hawaii, Porto Rico and Alaska. These latter shipments are not exports in a commercial or economic sense, but so far as the present study is concerned they are. In arriving at a balance sheet of the food in the United States it makes no difference whether wheat flour went to Hawaii or to China. In either case it left the continental area of the United States and was not available for consumption within that area. The foods shipped to us from these non-contiguous areas have been taken account of in imports and production. It is clear therefore that the outgo in the same directions must be set down on the other side of the ledger. Consequently three basic "export" tables are required in order to arrive at a final net export result: viz. Domestic Exports, Foreign Exports, and Shipments to Non-contiguous Possessions.[1] In

[1] It should perhaps be explained that the shipments in both directions between the United States and the Philippine Islands are included in the regular import and export statistics. In other words, these islands are regarded, in this sense, as a foreign country.

order not to encumber the text with too many and too detailed tables, it has been decided to present in this chapter only the following export tables:

1. Gross domestic exports of primary human foods to foreign countries and insular possessions.

2. Gross domestic exports of secondary human foods to foreign countries and insular possessions.

(1 and 2 comprise exports of human foodstuffs *produced* in the United States.)

To arrive at these final tables it was necessary to work out in addition detailed tables of (*a*) domestic exports to foreign countries, (*b*) domestic exports to insular possessions, (*c*) re-exports of imported foreign primary human foodstuffs, (*d*) re-exports of imported foreign secondary human foodstuffs. For the reasons above stated it seems unnecessary, however, to include all this detail here.

There is one further point in connection with the method of handling the export statistics here which needs careful discussion and explanation, because it is the point on which there is likely to be most difference of opinion and criticism. It will be noted in the export tables in this chapter that of the five great cereals, wheat, corn, oats, barley and rye, wheat is the only one included in the tables. In case of all the others only the derivative products appear and not the whole grain. Thus for corn, only the cornmeal export appears. The export of corn, as grain, is accounted for among the exports of "Primary feeds and fodders, including raw grains." The same is true of oats, rye and barley.

The first mental reaction of everyone at this point will be to say that surely the rye which is exported is used but slightly, if at all, as feed for animals. Of course it is not; so far there is no difference of opinion. But the first concern of this whole study is the most accurate determination possible of the *domestic* consumption of human food in the United States. We are not, here and now, primarily concerned with what happens to our food exports after they reach their destination. In determining human food consumption in this country we start with certain known general principles, of which the first is that, broadly speaking, no one of the five grains, wheat, corn, oats, barley and rye, is consumed as human food in the United States, at least in any appreciable quantity, until *after* it has passed through a manufacturing process such as grinding, cracking, rolling, etc. This being so, the amount used

in human consumption can be most accurately determined if we get statistics of the amount of the derived product, flour, meal, etc., actually produced by the mills of the country. This has been done in Table 7. The balance of the crop of each of the grains which remains after the manufacture of the derivative human food products is used up in one or another of three ways: either as food for animals, or as export, or for industrial, non-food purposes.

Since for reasons of accuracy, as above stated, the derivative products of the grains are alone considered on the *production* side of the human food ledger, it is clear that it would be unfair to balance against these the exports of the whole grains. This would give an erroneous result in two directions. First, and most important, it would make the domestic consumption appear smaller than it really is; and second it would imply that all of the raw grain exported goes to human food uses, which is only in degree less erroneous than to say that all of the export goes to animal feeding. The method here used of charging exports of derivative cereal products only against production, in balancing the *human* food ledger, gives accurate results as to domestic consumption, which is our primary problem. At the end of the analysis it also gives accurate results as to total amount of nutrients shipped abroad, because all of the raw grain imports and exports are accounted for in the tables dealing with the class of materials here grouped together under the rubric "Primary feeds and fodders, including raw grains." Wheat is the only grain differently treated, and in that case the total exports, as well as total imports, have been included in the human food tables because so very large a fraction of the crop goes to human food. It was simpler and just as accurate in such cases to deduct proper amounts for uses other than as human food. The corn crop presents exactly the opposite situation. Only a small fraction of it is consumed directly by human beings.

With this explanation it is hoped that the reader will be willing, for the sake of accuracy in the determination of our domestic consumption of food by human beings, to forego any reference value which would attach to having data as to exports and imports of the whole grains available here.

In Table 35 are given the total domestic exports of primary foods to all destinations, both foreign and U. S. insular, grouped as in former tables. Special explanations of the method of arriving at the figures are not necessary for many of the items. The nutrient

conversion factors used are the same as those which have been used in the earlier tables and the commodity statistics are taken without change from the reports of the Department of Commerce. In general no deductions for non-food uses, losses, spoilage, etc., are made on export figures, for the simple reason that the whole amount as stated leaves our shores, and we are not now concerned with what happens to it afterward. There are some commodities which have not appeared before, and for these special explanations follow.

GRAINS AND THEIR DERIVATIVE PRODUCTS

98. Bread and Biscuit.—For the calculation of nutrients of this item the weighted averages of all analyses of "crackers" as given by Atwater and Bryant were used. This includes Boston crackers, butter crackers, cream crackers, egg crackers, flat bread, graham crackers, miscellaneous crackers, oatmeal crackers, oyster crackers, pilot bread, pretzels, saltines, soda crackers and water crackers.

101. Rice.—The figures are for cleaned rice.

103. Wheat.—Nutrients in flour which would be produced from the stated amount of wheat were calculated, allowing as before for higher milling extraction in 1917–18. In other words, the figures represent what would have been the nutritive value of the exported wheat to the American people had it stayed here.

VEGETABLES

105. Beans and Dried Peas.—The factors for calculating nutrients were obtained by averaging Atwater and Bryant's analyses of dried beans, dried lima beans and dried peas.

SACCHARINE MATERIALS

There is a small export of confectionery from the United States which is not reported except in money values. It is nutritionally so insignificant an item that it is not worth while to attempt to estimate poundage from the values given.

109. Grape Sugar.—The carbohydrate content is taken at 91 per cent. in calculating nutrient values.

113. Syrup.—This item does not include maple syrup. It is made up of the various sorts of mixed cane and corn syrups. In calculating nutrients on this item, an average carbohydrate content of 85 per cent. has been assumed.

114. Refined Sugar.—In the export statistics this item includes maple sugar. The proportionate amount of the latter in the total, however, is so very inconsiderable that no attention has been paid to its presence in calculating nutrients. In other words a carbohydrate content of 100 per cent. is used for this item.

FRUITS

118. Peaches, Dried.—Atwater and Bryant give no analysis of dried peaches. As a sufficiently close approximation the analysis of dried apricots has been used in calculating the conversion factors for dried peaches. These two fruits in the fresh state are very nearly alike in composition, and must also be so in the dried state.

FISH

127. Fresh Fish.—This item is the same as the "Fish, fresh, except salmon" export item of the Department of Commerce Reports. In dealing analytically with this rubric a different procedure has been followed than in the case of the production and imports. In both those cases it will be recalled that before calculating nutrients the inedible refuse was deducted. In the case of exports the following average of Atwater and Bryant's fresh fish "as purchased" analyses is used to get the conversion factors, and these are applied to the total poundage exported.

Protein	10.0 per cent.
Fat	2.8 per cent.
Calories	304 per pound

128. Cured Fish.—This includes the total exports of dried, smoked, and cured fish which are separately reported by the Department of Commerce under three heads, viz., (*a*) "Dried, smoked or cured cod, haddock, hake and pollack," (*b*) "Dried, smoked or cured herring," and (*c*) "Fish, dried, smoked or cured, all others." The same analytical factors were used as for the corresponding import item in Chapter VI.

129. Pickled Fish.—This is the "Fish, pickled, except salmon" item of the Commerce Reports. The same analytical factors were used as for item 127.

The conversion factors for such items as have not been given in previous chapters are presented in Table 34.

TABLE 34.—FACTORS BY WHICH AMOUNTS, IN ORIGINAL UNITS, OF DOMESTIC EXPORTS OF PRIMARY FOODS ARE TO BE MULTIPLIED TO GET SHORT TONS OF NUTRIENTS

Reference No.	Commodity	Original specified units of measure	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
98	Bread and biscuit	lb.	0.000053	0.000044	0.000359	0.001905
105	Beans and dried peas	bu.	0.006510	0.000420	0.018750	0.097512
108	Glucose	lb.	0	0	0.000425	0.001581
109	Grape sugar	lb.	0	0	0.000455	0.001693
113	Syrup	gal.	0	0	0.005100	0.018972
115	Apples, dried	lb.	0.000008	0.000011	0.000331	0.001350
117	Peaches, dried	lb.	0.000023	0.000005	0.000313	0.001290
120	Apricots, dried	lb.	0.000023	0.000005	0.000313	0.001290
121	Prunes, dried	lb.	0.000009	0	0.000311	0.001190
122	Raisins, dried	lb.	0.000011	0.000015	0.000343	0.001445
127	Fresh fish	lb.	0.000050	0.000014	0	0.000304
129	Pickled fish	bbl.	0.017000	0.005100	0	0.108800
130	Canned salmon	lb.	0.000097	0.000038	0	0.000680

The gross exports to all destinations of primary foods domestically produced are shown in Table 35, arranged on the same plan as the earlier basic tables.

TABLE 35.—TOTAL GROSS DOMESTIC EXPORTS OF PRIMARY HUMAN FOODS TO FOREIGN COUNTRIES AND INSULAR POSSESSIONS, FROM 1911–12 TO 1917–18

1911–12

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	19,695,190	8,934	947	786	6,414	37,520
99	Cornmeal and corn flour	bbl.	481,852	42,846	3,213	1,799	28,231	145,677
100	Oatmeal and rolled oats	lb.	9,794,506	4,438	718	319	2,991	18,199
101	Rice	lb.	161,794,388	73,389	5,871	146	57,973	263,887
102	Rye flour	bbl.	4,306	383	27	4	301	1,376
103	Wheat (nutrients in flour)	bu.	30,264,954	823,691	68,174	5,986	449,099	2,176,807
104	Wheat flour	bbl.	11,467,312	1,019,502	116,223	10,195	765,642	3,711,185
	Sub-total—Grains			1,973,183	195,173	19,235	1,310,651	6,354,651
	Vegetables							
105	Beans and dried peas	bu.	539,680	14,688	3,188	206	8,180	52,626
106	Onions	bu.	363,499	9,233	129	27	819	4,157
107	Potatoes (except sweet)	bu.	1,537,945	41,857	753	41	6,153	28,706
	Sub-total—Vegetables			65,778	4,670	274	16,152	85,489
	Saccharine Materials							
108	Glucose	lb.	126,395,045	57,332	.....	.....	48,732	199,831
109	Grape sugar	lb.	44,761,214	20,304	.....	.....	18,476	75,781
110	Honey	lb.	1,200,000	544	2	.....	442	1,824
111	Molasses	gal.	9,513,441	47,468	.....	.....	30,854	126,519
112	Molasses and syrup	gal.	23,817	119	.....	.....	77	317
113	Syrup	gal.	19,146,986	104,220	.....	.....	88,587	363,257
114	Refined sugar	lb.	93,735,319	42,517	.....	.....	42,517	174,348
	Sub-total—Sugars			272,504	2	.....	229,685	941,877
	Fruits							
115	Apples, dried	lb.	53,664,639	24,342	389	535	16,114	72,447
116	Apples, green and ripe	bbl.	1,477,430	96,503	289	289	10,422	46,805
117	Oranges	boxes	1,232,244	38,009	152	38	2,927	12,820
118	Peaches, dried	lb.	4,425,803	2,008	92	20	1,256	5,709
119	Pears	bbl.	196,157	12,813	64	51	1,461	6,468
120	Apricots, dried	lb.	13,413,430	6,084	280	61	3,808	17,303
121	Prunes, dried	lb.	74,446,647	33,769	608	.....	21,004	88,591
122	Raisins, dried	lb.	20,373,543	9,242	203	277	6,340	29,439
	Sub-total—Fruits			222,770	2,077	1,271	63,332	279,582
	Vegetable Oils and Nuts							
123	Peanuts	lb.	5,920,711	2,686	521	892	387	12,019
124	Corn oil	lb.	23,866,146	10,826	.....	10,609	.....	98,710
125	Cottonseed oil	lb.	399,948,566	181,416	.....	177,786	.....	1,654,187
126	Cocoa and chocolate, manufactured	lb.	2,584,000	1,172	202	455	399	6,693
	Sub-total—Oils and Nuts			196,100	723	189,742	786	1,771,609
	Fish							
127	Fresh fish	lb.	5,034,771	2,284	228	64	.....	1,531
128	Cured fish	lb.	20,641,140	9,363	1,592	505	.....	11,229
129	Pickled fish	bbl.	21,839	1,981	337	107	.....	2,376
130	Canned salmon	lb.	45,985,044	20,859	4,046	1,585	.....	31,270
	Sub-total—Fish			34,487	6,203	2,261	.....	46,406
	Grand Total—Total Domestic Exports of Primary Foods			2,764,822	208,248	212,783	1,620,606	9,479,617

TABLE 35—*Continued*

1912–13

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	17,606,044	7,986	846	703	5,733	33,539
99	Cornmeal and corn flour	bbl.	480,374	42,715	3,203	1,794	28,144	145,230
100	Oatmeal and rolled oats	lb.	48,714,976	22,097	3,579	1,591	14,894	90,610
101	Rice	lb.	157,583,225	71,479	5,718	142	56,463	257,018
102	Rye flour	bbl.	5,296	471	32	5	370	1,692
103	Wheat (nutrients in flour)	bu.	91,716,672	2,496,161	206,596	18,138	1,360,975	6,596,722
104	Wheat flour	bbl.	11,885,056	1,056,641	120,457	10,567	793,534	3,846,194
—	*Sub-total—Grains*	...	.....	3,697,550	340,431	32,940	2,260,113	10,971,005
	Vegetables							
105	Beans and dried peas	bu.	623,587	16,971	3,683	237	10,606	60,807
106	Onions	bu.	634,876	16,126	226	48	1,435	7,261
107	Potatoes (except sweet)	bu.	2,416,819	65,776	1,183	66	9,670	45,115
	Sub-total—Vegetables	...	.....	98,873	5,092	351	21,711	113,183
	Saccharine Materials							
108	Glucose	lb.	158,365,601	71,834	.....	.....	61,059	250,376
109	Grape sugar	lb.	41,783,642	18,953	.....	.....	17,247	70,740
110	Honey	lb.	1,750,000	794	3	.....	645	2,660
111	Molasses	gal.	2,145,613	10,706	.....	.....	6,959	28,535
112	Molasses and syrup	gal.	32,243	161	.....	.....	105	429
113	Syrup	gal.	14,309,029	77,886	.....	.....	66,203	271,471
114	Refined sugar	lb.	58,707,501	26,629	.....	.....	26,629	109,196
	Sub-total—Sugars	...	.....	206,963	3	.....	178,847	733,407
	Fruits							
115	Apples, dried	lb.	41,574,564	18,858	302	415	12,484	56,126
116	Apples, green and ripe	bbl.	2,178,339	142,284	427	427	15,367	69,010
117	Oranges	boxes	1,096,879	33,833	135	34	2,606	11,412
118	Peaches, dried	lb.	6,529,633	2,962	136	30	1,854	8,423
119	Pears	bbl.	199,228	13,013	65	52	1,183	6,570
120	Apricots, dried	lb.	35,016,730	15,883	730	159	9,943	45,172
121	Prunes, dried	lb.	118,139,501	53,588	965	.....	33,331	140,586
122	Raisins, dried	lb.	28,586,614	12,966	285	389	8,895	41,308
	Sub-total—Fruits	...	.....	293,387	3,045	1,506	85,963	378,607
	Vegetable Oils and Nuts							
123	Peanuts	lb.	7,301,381	3,312	642	1,100	477	14,822
124	Corn oil	lb.	19,839,222	8,999	.....	8,819	.....	82,055
125	Cottonseed oil	lb.	315,575,610	143,144	.....	140,280	.....	1,305,220
126	Cocoa and chocolate, manufactured	lb.	1,420,000	644	111	250	219	3,678
	Sub-total—Oils and Nuts	...	.....	156,099	753	150,449	[illegible]	1,405,775
	Fish							
127	Fresh fish	lb.	5,517,248	2,503	250	70	.....	1,677
128	Cured fish	lb.	35,267,737	15,998	2,719	864	..	19,185
129	Pickled fish	bbl.	23,457	2,128	362	115	...	2,552
130	Canned salmon	lb.	57,799,442	26,218	5,086	1,992	.	39,304
	Sub-total—Fish	...	.....	46,847	8,417	3,041	. .	62,718
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	4,499,719	357,741	188,287	2,547,330	13,664,695

TABLE 35—*Continued*

Reference No.	Commodity	Original units	1913–14					
			Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	17,255,430	7,827	830	688	5,620	32,872
99	Cornmeal and corn flour	bbl.	372,316	33,107	2,483	1,390	21,814	112,560
100	Oatmeal and rolled oats	lb.	16,206,262	7,351	1,191	530	4,955	30,143
101	Rice	lb.	163,091,360	73,978	5,918	148	58,437	266,002
102	Rye flour	bbl.	8,293	737	50	6	580	2,649
103	Wheat (nutrients in flour)	bu.	92,523,569	2,518,121	208,414	18,299	1,372,949	6,654,757
104	Wheat flour	bbl.	12,298,898	1,093,434	124,651	10,934	821,165	3,980,120
	Sub-total—Grains	...	.....	3,734,555	343,537	31,995	2,285,520	11,079,103
	Vegetables							
105	Beans and dried peas	bu.	498,609	13,570	2,944	190	8,481	48,621
106	Onions	bu.	432,766	10,993	154	33	979	4,949
107	Potatoes (except sweet)	bu.	2,188,563	59,563	1,072	60	8,756	40,854
	Sub-total—Vegetables	...	.....	84,126	4,170	283	18,216	94,424
	Saccharine Materials							
108	Glucose	lb.	162,680,378	73,791	.....	.....	62,722	257,198
109	Grape sugar	lb.	36,850,496	16,715	.....	.....	15,211	62,388
110	Honey	lb.	2,000,000	907	4	.....	737	3,040
111	Molasses	gal.	1,002,441	5,002	.....	.....	3,251	13,331
112	Molasses and syrup	gal.	30,746	153	.....	.....	160	409
113	Syrup	gal.	11,630,528	63,307	.....	.....	53,811	226,654
114	Refined sugar	lb.	69,344,463	31,454	.....	.....	31,454	128,981
	Sub-total—Sugars	...	.....	191,329	4	.....	167,286	686,001
	Fruits							
115	Apples, dried	lb.	33,566,160	15,226	244	335	10,079	45,314
116	Apples, green and ripe	bbl.	1,526,746	99,724	299	299	10,770	48,367
117	Oranges	boxes	1,595,928	49,226	197	49	3,790	16,604
118	Peaches, dried	lb.	6,712,296	3,045	140	31	1,906	8,659
119	Pears	bbl.	350,731	22,909	115	92	2,612	11,566
120	Apricots, dried	lb.	17,401,692	7,893	363	79	4,941	22,448
121	Prunes, dried	lb.	69,965,847	31,736	571	0	19,740	83,259
122	Raisins, dried	lb.	15,051,842	6,827	150	204	4,684	21,749
	Sub-total—Fruits	...	.....	236,586	2,079	1,089	58,522	257,966
	Vegetable Oils and Nuts							
123	Peanuts	lb.	8,054,817	3,654	709	1,213	526	16,351
124	Corn oil	lb.	18,281,576	8,292	.....	8,127	.....	75,613
125	Cottonseed oil	lb.	193,240,420	87,653	.....	85,900	.....	799,242
126	Cocoa and chocolate, manufactured	lb.	2,093,000	949	163	368	323	5,421
	Sub-total—Oils and Nuts	...	.....	100,548	872	95,608	849	896,627
	Fish							
127	Fresh fish	lb.	6,534,460	2,964	296	83	.....	1,986
128	Cured fish	lb.	31,400,072	14,243	2,421	769	.....	17,082
129	Pickled fish	bbl.	37,264	3,381	574	183	.....	4,055
130	Canned salmon	lb.	89,586,275	40,637	7,883	3,088	.....	60,919
	Sub-total—Fish	...	.....	61,225	11,174	4,123	.....	84,042
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	4,408,369	361,836	133,098	2,530,393	13,098,163

TABLE 35—*Continued*

Reference No.	Commodity	Original units	1914-15: Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	17,244,275	7,822	829	688	5,616	32,851
99	Cornmeal and corn flour	bbl.	548,783	48,796	3,659	2,049	32,152	165,911
100	Oatmeal and rolled oats	lb.	68,604,979	31,119	5,040	2,241	20,974	127,606
101	Rice	lb.	202,733,023	92,412	7,393	184	73,001	332,289
102	Rye flour	bbl.	80,315	7,140	485	64	5,619	25,659
103	Wheat (nutrients in flour)	bu.	259,761,780	7,069,676	585,127	51,373	3,854,580	18,683,366
104	Wheat flour	bbl.	16,633,214	1,478,776	168,579	14,787	1,110,555	5,382,775
	Sub-total—Grains	...	.....	8,735,741	771,112	71,386	5,102,497	24,750,457
	Vegetables							
105	Beans and dried peas	bu.	1,425,091	38,785	8,416	543	24,241	138,964
106	Onions	bu.	800,487	20,333	285	61	1,810	9,155
107	Potatoes (except sweet)	bu.	3,512,153	95,587	1,721	95	14,051	65,561
	Sub-total—Vegetables	...	.....	154,705	10,422	699	40,102	213,680
	Saccharine Materials							
108	Glucose	lb.	125,434,878	56,897	.....	.....	48,362	198,513
109	Grape sugar	lb.	33,027,630	14,981	.....	.....	13,633	55,916
110	Honey	lb.	2,500,000	1,134	5	.....	921	3,800
111	Molasses	gal.	1,148,741	5,732	.....	.....	3,726	15,277
112	Molasses and syrup	gal.	32,025	160	.....	.....	104	426
113	Syrup	gal.	11,439,133	62,265	.....	.....	52,925	217,023
114	Refined sugar	lb.	563,122,336	255,429	.....	.....	255,429	1,047,408
	Sub-total—Sugars	...	.....	396,598	5	.....	375,100	1,538,163
	Fruits							
115	Apples, dried	lb.	42,589,169	19,318	309	424	12,789	57,495
116	Apples, green and ripe	bbl.	2,376,689	155,240	466	466	16,766	75,294
117	Oranges	boxes	1,811,833	55,886	223	56	4,304	18,850
118	Peaches, dried	lb.	14,464,655	6,561	302	65	4,107	18,659
119	Pears	bbl.	248,124	16,207	81	65	1,848	8,182
120	Apricots, dried	lb.	23,764,342	10,779	496	108	6,748	30,656
121	Prunes, dried	lb.	43,628,892	19,790	356	.....	12,309	51,919
122	Raisins, dried	lb.	25,168,517	11,417	251	342	7,832	36,369
	Sub-total—Fruits	...	.....	295,198	2,484	1,526	66,703	297,424
	Vegetable Oils and Nuts							
123	Peanuts	lb.	5,875,076	2,665	517	885	384	11,926
124	Corn oil	lb.	17,789,635	8,069	.....	7,908	.....	73,578
125	Cottonseed oil	lb.	318,678,308	144,551	.....	141,661	.....	1,318,054
126	Cocoa and chocolate, manufactured	lb.	7,960,000	3,611	621	1,401	1,228	20,616
	Sub-total—Oils and Nuts	...	.....	158,896	1,138	151,855	1,612	1,424,174
	Fish							
127	Fresh fish	lb.	7,159,598	3,248	325	91	.....	2,177
128	Cured fish	lb.	26,332,800	11,944	2,030	645	.....	14,325
129	Pickled fish	bbl.	21,959	1,992	339	108	.....	2,389
130	Canned salmon	lb.	85,040,843	38,574	7,483	2,932	.....	57,827
	Sub-total—Fish	...	.....	55,758	10,177	3,776	.....	76,718
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	9,796,896	795,338	229,242	5,586,014	28,300,616

TABLE 35—*Continued*

1915–16

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	17,908,334	8,123	861	715	5,833	34,116
99	Cornmeal and corn flour	bbl.	510,632	45,405	3,404	1,906	29,917	154,378
100	Oatmeal and rolled oats	lb.	54,998,747	24,947	4,041	1,796	16,814	102,298
101	Rice	lb.	264,058,314	119,776	9,582	239	94,618	430,679
102	Rye flour	bbl.	119,619	10,635	723	96	8,370	38,216
103	Wheat (nutrients in flour)	bu.	173,377,732	4,718,649	390,543	34,289	2,572,736	12,470,194
104	Wheat flour	bbl.	16,001,671	1,422,628	162,179	14,226	1,068,389	5,178,397
	Sub-total—Grains	...	.....	6,350,163	571,333	53,267	3,796,677	18,408,278
	Vegetables							
105	Beans and dried peas	bu.	1,999,680	54,424	11,809	761	34,014	194,992
106	Onions	bu.	649,461	16,497	230	50	1,469	7,427
107	Potatoes (except sweet)	bu.	4,564,705	122,600	2,208	123	18,022	84,090
	Sub-total—Vegetables	...	.....	193,521	14,247	934	53,505	286,509
	Saccharine Materials							
108	Glucose	lb.	148,523,098	67,370	.....	.....	57,264	234,815
109	Grape sugar	lb.	37,883,084	17,184	.....	.....	15,637	64,136
110	Honey	lb.	3,300,000	1,497	6	.....	1,216	5,016
111	Molasses	gal.	4,387,369	21,891	.....	.....	14,229	58,348
112	Molasses and syrup	gal.	25,352	126	.....	.....	82	337
113	Syrup	gal.	10,031,693	54,604	.....	.....	46,414	190,321
114	Refined sugar	lb.	1,642,552,040	745,053	.....	.....	715,053	3,055,147
	Sub-total—Sugars	...	.....	907,725	6	.....	879,895	3,608,120
	Fruits							
115	Apples, dried	lb.	16,219,174	7,357	118	161	4,871	21,896
116	Apples, green and ripe	bbl.	1,494,693	97,630	293	293	10,544	47,352
117	Oranges	boxes	1,625,915	50,151	200	51	3,861	16,916
118	Peaches, dried	lb.	13,739,342	6,232	287	62	3,901	17,724
119	Pears	bbl.	172,933	11,296	56	45	1,288	5,703
120	Apricots, dried	lb.	23,939,790	10,859	500	109	6,798	30,882
121	Prunes, dried	lb.	57,572,827	26,115	470	0	16,242	68,512
122	Raisins, dried	lb.	75,285,489	34,149	751	1,024	23,426	108,787
	Sub-total—Fruits	...	.....	243,789	2,675	1,745	70,931	317,772
	Vegetable Oils and Nuts							
123	Peanuts	lb.	8,669,430	3,932	763	1,306	566	17,599
124	Corn oil	lb.	8,967,826	4,668	.....	3,986	.....	37,091
125	Cottonseed oil	lb.	266,688,964	120,969	.....	118,550	.....	1,103,026
126	Cocoa and chocolate, manufactured	lb.	9,992,000	4,532	780	1,759	1,541	25,879
	Sub-total—Oils and Nuts	...	.....	133,501	1,543	125,601	2,107	1,183,595
	Fish		8,139,309	3,692	369	103	.....	2,474
127	Fresh fish	lb.	35,034,740	15,892	2,701	858	.....	19,059
128	Cured fish	lb.	17,266	1,566	266	85	.....	1,878
129	Pickled fish	bbl.	155,387,363	70,483	13,674	5,356	.....	105,664
130	Canned salmon	lb.						
	Sub-total—Fish	...	.....	91,633	17,010	6,402	.....	129,075
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	7,920,332	606,814	187,949	4,803,115	23,933,349

TABLE 35—*Continued*

1916–17

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	18,704,911	8,485	899	747	6,092	35,633
99	Cornmeal and corn flour	bbl.	586,452	52,146	3,910	2,190	34,359	177,300
100	Oatmeal and rolled oats	lb.	111,211,469	50,975	8,172	3,632	34,000	206,853
101	Rice	lb.	342,009,963	155,135	12,410	310	122,551	557,818
102	Rye flour	bbl.	73,914	6,571	447	59	5,172	23,614
103	Wheat (nutrients in flour)	bu.	150,064,601	4,084,158	338,029	29,677	2,226,794	10,793,397
104	Wheat flour	bbl.	12,388,479	1,101,397	125,559	11,014	827,146	4,009,110
	Sub-total—Grains	...	.....	5,458,867	489,426	47,629	3,256,114	15,803,725
	Vegetables							
105	Beans and dried peas	bu.	2,396,622	65,226	14,154	914	40,767	233,699
106	Onions	bu.	447,723	11,373	159	34	1,012	5,120
107	Potatoes (except sweet)	bu.	2,866,735	78,021	1,404	78	11,468	53,513
	Sub-total—Vegetables	...	.....	154,620	15,717	1,026	53,247	292,332
	Saccharine Materials							
108	Glucose	lb.	170,025,606	77,123	.....	.....	65,554	268,810
109	Grape sugar	lb.	44,997,709	20,411	.....	.....	18,574	76,181
110	Honey	lb.	4,025,000	1,826	7	.....	1,482	6,118
111	Molasses	gal.	2,892,061	14,430	.....	.....	9,379	38,462
112	Molasses and syrup	gal.	40,570	202	.....	.....	132	540
113	Syrup	gal.	10,327,503	56,214	.....	.....	47,782	195,933
114	Refined sugar	lb.	1,250,551,796	571,326	...	...	571,326	2,342,767
	Sub-total—Sugars	...	.....	741,532	7	.....	714,229	2,928,811
	Fruits							
115	Apples, dried	lb.	10,530,474	4,777	76	105	3,162	14,216
116	Apples, green and ripe	bbl.	1,769,778	115,598	347	347	12,484	56,666
117	Oranges	boxes	1,904,638	58,749	236	59	4,523	19,816
118	Peaches, dried	lb.	8,187,588	3,714	170	37	2,325	10,562
119	Pears	bbl.	339,064	22,147	111	89	2,525	11,181
120	Apricots, dried	lb.	9,843,719	4,465	205	44	2,795	12,698
121	Prunes, dried	lb.	59,795,141	27,123	488	0	16,870	71,157
122	Raisins, dried	lb.	52,354,911	23,748	523	713	16,291	75,653
	Sub-total—Fruit	...	.....	260,321	2,156	1,394	60,975	271,349
	Vegetable Oils and Nuts							
123	Peanuts	lb.	22,413,297	10,167	1,972	3,375	1,464	45,499
124	Corn oil	lb.	8,779,760	3,982	.....	3,903	.....	36,313
125	Cottonseed oil	lb.	159,074,949	72,156	.....	70,712	.....	657,934
126	Cocoa and chocolate, manufactured	lb.	11,820,000	5,362	922	2,080	1,823	30,614
	Sub-total—Oils and Nuts	...	.....	91,667	2,894	80,070	3,287	770,360
	Fish							
127	Fresh fish	lb.	9,998,503	4,535	454	127	.....	3,040
128	Cured fish	lb.	37,873,713	17,180	2,921	927	.....	20,603
129	Pickled fish	bbl.	22,698	2,059	350	111	.....	2,469
130	Canned salmon	lb.	120,327,896	54,581	10,588	4,148	.....	81,823
	Sub total—Fish	...	.....	78,355	14,313	5,313	.....	107,935
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	6,785,362	524,513	135,432	4,087,852	20,174,512

TABLE 35 —*Continued*

1917–18*

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Their Derivative Products							
98	Bread and biscuit	lb.	18,646,461	8,457	897	744	6,073	35,521
99	Cornmeal and corn flour	bbl.	2,059,452	183,096	13,733	7,691	120,659	622,626
100	Oatmeal and rolled oats	lb.	350,961,422	159,196	25,790	11,461	107,298	652,788
101	Rice	lb.	330,146,247	149,754	11,981	299	118,360	538,468
102	Rye flour	bbl.	844,094	75,040	5,103	675	59,056	269,657
103	Wheat (nutrients in flour)	bu.	34,141,886	929,200	78,393	6,876	516,385	2,502,908
104	Wheat flour	bbl.	23,295,085	2,071,650	236,099	20,711	1,555,352	7,538,662
	Sub-total—Grains	...	.....	3,575,793	371,996	48,457	2,483,123	12,160,630
	Vegetables							
105	Beans and dried peas	bu.	2,383,980	64,883	14,160	948	40,256	232,013
106	Onions	bu.	636,107	16,158	227	49	1,438	7,275
107	Potatoes (except sweet)	bu.	3,926,083	106,852	1,924	107	15,707	73,288
	Sub-total—Vegetables	...	.....	187,893	16,311	1,104	57,401	312,576
	Saccharine Materials							
108	Glucose	lb.	80,970,744	36,728	.....	.....	31,219	128,015
109	Grape sugar	lb.	16,887,557	7,660	.....	.....	6,971	28,591
110	Honey	lb.	16,090,672	7,299	29	.....	5,927	24,458
111	Molasses	gal.	3,811,341	19,017	.....	.....	12,361	50,687
112	Molasses and syrup	gal.	19,847	99	.....	.....	64	264
113	Syrup	gal.	7,690,074	41,858	.....	.....	35,579	145,896
114	Refined sugar	lb.	628,897,995	285,265	.....	.....	285,265	1,169,750
	Sub-total—Sugars	...	.....	397,926	29	.....	377,386	1,547,661
	Fruits							
115	Apples, dried	lb.	2,602,590	1,181	19	26	781	3,513
116	Apples, green and ripe	bbl.	659,140	43,054	130	130	4,649	20,882
117	Oranges	boxes	1,273,434	39,280	157	39	3,025	13,249
118	Peaches, dried	lb.	5,862,605	2,659	122	26	1,665	7,563
119	Pears	bbl.	244,575	15,975	80	64	1,821	8,065
120	Apricots, dried	lb.	5,175,618	2,348	108	23	1,470	6,677
121	Prunes, dried	lb.	33,051,546	14,992	270	0	9,325	39,332
122	Raisins, dried	lb.	55,353,650	25,108	553	753	17,224	79,986
	Sub-total—Fruits	...	.....	144,597	1,439	1,061	39,960	179,267
	Vegetable Oils and Nuts							
123	Peanuts	lb.	12,488,209	5,665	1,099	1,881	816	25,351
124	Corn oil	lb.	1,831,114	831	.....	814	.....	7,573
125	Cottonseed oil	lb.	100,337,989	45,513	.....	44,602	.....	414,998
126	Cocoa and chocolate, manufactured	lb.	34,864,000	15,814	2,720	6,136	5,377	90,298
	Sub-total—Oils and Nuts	...	.....	67,823	3,819	53,433	6,193	538,220
	Fish							
127	Fresh fish	lb.	10,467,708	4,748	475	133	.....	3,182
128	Cured fish	lb.	47,459,008	21,528	3,659	1,162	.....	25,817
129	Pickled fish	bbl.	26,651	2,418	411	131	.....	2,899
130	Canned salmon	lb.	112,607,274	51,079	9,909	3,882	.....	76,573
	Sub-total—Fish	...	.....	79,773	14,454	5,308	.....	108,471
	Grand Total—Total Domestic Exports of Primary Foods	...	.....	4,453,805	408,048	109,363	2,964,063	14,846,825

* In the total domestic exports of the year 1917–18 are included the shipments to the American Expeditionary Forces abroad, as well as shipments to the Commission for Relief in Belgium and American Red Cross.

The next point for consideration is the export of secondary foods. No summary or discussion of the gross domestic exports of primary foods will be made at this point for the reason that such discussion may better be deferred until some further data have been presented. The gross domestic exports of secondary human food materials appear in Table 37. There are certain items in the table which need explanation, but no space will be taken to discuss items which have simply received routine treatment, namely export statistics taken from Commerce Reports, and conversion factors based upon Atwater and Bryant's analyses of the same product, or the use of the same conversion factors as in earlier chapters for the same products.

MEATS AND DERIVATIVE PRODUCTS

132. Canned Beef.—The analytic values used to obtain conversion factors were those for canned corned beef, as given by Atwater and Bryant. The product is fairly representative of all the canned beef products in its composition.

133. Pickled Beef.—The analysis used was that of "salted mess beef" as given by Atwater and Bryant.

134. Fresh Pork.—The same factors were used as in Chapter VI for the imports of the same commodity.

135. Pickled Pork.—To obtain conversion factors an average was taken of the analyses of "Dry-salted bellies," "Salt pork, clear fat," and "Salt pork, lean ends" as given in Atwater and Bryant.

136. Canned Pork.—The analysis of canned boar's head was used, as being probably most nearly representative of the run of export canned pork.

138. Hams and Shoulders.—Average analyses of hams and shoulders were used.

139 141. Lard, Neutral Lard and Lard Compounds.—All these products were taken as 100 per cent. fat.

142. Sausage, Canned.—This item includes "canned sausage" and "all other sausage" of the domestic export list, and "sausage" of the insular list. The average was taken of all analyses of canned sausage as given in Atwater and Bryant. *Sausage, all other.* The average was taken of all analyses of fresh sausage as given in Atwater and Bryant.

143. Mutton.—This export item is exclusive of canned mutton. The same analysis was used as for mutton and lamb in Chapter IV.

144-146. Stearin from Animal Fats, Tallow and Oleo Oil. These products were taken as 100 per cent. fat.

151. Milk, Condensed and Evaporated.—For the conversion factors an average was taken of Atwater and Bryant's figures for condensed, sweetened milk and evaporated, unsweetened milk.

The conversion factors for such products as have not previously appeared are given in Table 36.

TABLE 36.—FACTORS BY WHICH AMOUNTS, IN ORIGINAL UNITS, OF DOMESTIC EXPORTS OF SECONDARY FOODS ARE TO BE MULTIPLIED TO GET SHORT TONS OF NUTRIENTS

Reference No.	Commodity	Original units	To short tons of protein	To short tons of fat	To short tons of carbohydrate	To millions of calories
132	Canned beef	lb.	0.000131	0.000093	0	0.001280
133	Pickled beef	lb.	0.000056	0.000199	0	0.001890
135	Pickled pork	lb.	0.000028	0.000365	0	0.003189
136	Canned pork	lb.	0.000103	0.000111	0	0.001320
137	Bacon	lb.	0.000047	0.000297	0	0.002685
138	Hams and shoulders	lb.	0.000067	0.000165	0	0.001644
139	Lard*	lb.	0	0.000500	0	0.004220
142	Canned sausage	lb.	0.000082	0.000138	0.000001	0.001475
	Sausage, all other	lb.	0.000114	0.000159	0.000003	0.001775
151	Milk, condensed and evaporated	lb.	0.000046	0.000044	0.000163	0.001150

* The same conversion factors apply to neutral lard, lard compounds and substitutes, stearin from animal fat, oleo oil and tallow.

In Table 37 appear the detailed figures for gross domestic exports of secondary human food materials.

There is only one point regarding the shipments of food to our insular possessions which calls for special comment. It is this: if one examines carefully into the matter it will be found that there was a general tendency for the shipments of human food to Porto Rico and Hawaii to increase beginning with the year 1914–15, and continuing until 1917–18. Or, in other words, the export of foodstuffs to these territories showed the same reaction to war conditions as did exports to foreign countries. That this should have been the fact seems ridiculous, but it is a fact. It is difficult to conceive that the onset of a war in Europe in August, 1914 should have forthwith enhanced the need of the inhabitants of Hawaii and Porto Rico for imported food. The true explanation of this curious result is

TABLE 37.—TOTAL GROSS DOMESTIC EXPORTS OF SECONDARY HUMAN FOODS TO FOREIGN COUNTRIES AND INSULAR POSSESSIONS, FROM 1911–12 TO 1917–18

1911–12

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	15,434,371	7,001	1,064	1,078	.....	14,431
132	Canned beef	lb.	11,458,983	5,198	1,361	966	.....	14,668
133	Pickled beef	lb.	39,066,192	17,721	1,985	7,053	.....	73,835
134	Fresh pork	lb.	2,597,880	1,178	158	285	.....	3,299
135	Pickled pork	lb.	70,641,427	32,043	1,795	23,391	.....	225,275
136	Canned pork	lb.	5,896,519	2,675	551	594	.....	7,784
137	Bacon	lb.	209,141,228	94,866	8,917	56,351	.....	561,544
138	Hams and shoulders	lb.	208,623,897	94,631	12,680	31,227	.....	342,978
139	Lard	lb.	532,395,681	242,854	.....	242,854	.....	2,259,370
140	Neutral lard	lb.	62,317,909	28,267	.....	28,267	.....	262,982
141	Lard compounds	lb.	70,662,778	32,052	.....	32,052	.....	298,197
142	Sausage*	lb.	7,344,259	3,332	730	1,040	19	12,736
143	Mutton	lb.	3,595,543	1,631	212	391	.....	4,512
144	Stearin from animal fats	lb.	3,000,000	1,361	.....	1,361	.....	12,660
145	Tallow	lb.	39,451,419	17,895	.....	17,895	.....	166,485
146	Oleo oil	lb.	126,467,124	57,365	.....	57,365	.....	533,691
147	Oleomargarine	lb.	3,661,463	1,660	20	1,378	.....	12,907
	Sub-total—Meats	....	.....	641,730	29,473	503,548	19	4,807,354
	Poultry and Eggs							
148	Eggs	doz.	15,591,873	10,609	1,387	990	.....	14,860
	Dairy Products							
149	Butter	lb.	7,278,521	3,301	32	2,806	.....	26,240
150	Cheese	lb.	7,497,613	3,401	878	1,150	82	14,620
151	Milk, condensed and evaporated	lb.	25,732,650	11,672	1,073	1,027	3,805	29,592
	Sub-total—Dairy Products	....	.....	18,374	1,983	4,983	3,887	70,452
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	670,713	32,843	509,521	3,906	4,892,666

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37—*Continued*

Reference No.	Commodity	Original units	1912–13					
			Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	7,387,169	3,351	510	516	.....	6,907
132	Canned beef	lb.	7,544,816	3,422	897	637	.....	9,658
133	Pickled beef	lb.	26,247,429	11,906	1,334	4,738	.....	49,608
134	Fresh pork	lb.	2,457,997	1,115	150	269	.....	3,122
135	Pickled pork	lb.	65,623,034	29,766	1,667	21,729	.....	209,272
136	Canned pork	lb.	4,188,577	1,900	392	422	.....	5,529
137	Bacon	lb.	201,879,766	91,572	8,608	54,394	.....	542,047
138	Hams and shoulders	lb.	163,428,599	74,131	9,933	24,463	.....	268,676
139	Lard	lb.	522,346,697	236,935	.....	236,935	.....	2,204,303
140	Neutral lard	lb.	44,777,692	20,311	.....	20,311	.....	188,962
141	Lard compounds	lb.	77,430,154	35,122	.....	35,122	.....	326,755
142	Sausage*	lb.	8,681,026	3,938	865	1,231	22	15,074
143	Mutton	lb.	5,266,019	2,389	310	573	.....	6,609
144	Stearin from animal fats	lb.	3,744,886	1,699	.....	1,699	.....	15,803
145	Tallow	lb.	30,586,350	13,874	.....	13,874	.....	129,074
146	Oleo oil	lb.	92,849,757	42,116	.....	42,116	.....	391,826
147	Oleomargarine	lb.	3,017,626	1,369	16	1,137	.....	10,637
	Sub-total—Meats	....	.....	574,916	24,682	460,166	22	4,383,862
	Poultry and Eggs							
148	Eggs	doz.	20,658,402	14,055	1,836	1,312	.....	19,687
	Dairy Products							
149	Butter	lb.	4,696,757	2,130	21	1,811	.....	16,932
150	Cheese	lb.	3,292,348	1,493	385	504	36	6,420
151	Milk, condensed and evaporated	lb.	21,492,429	9,749	897	858	3,178	24,716
	Sub-total—Dairy Products	....	.....	13,372	1,303	3,173	3,214	48,068
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	602,343	27,821	464,651	3,236	4,451,617

*This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37—*Continued*

Reference No.	Commodity	Original units	Total domestic exports in original units	1913 14: Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	6,394,421	2,900	441	446	.....	5,979
132	Canned beef	lb.	3,652,792	1,657	434	308	.....	4,676
133	Pickled beef	lb.	23,495,991	10,657	1,194	4,242	.....	44,408
134	Fresh pork	lb.	2,668,020	1,210	162	293	.....	3,388
135	Pickled pork	lb.	60,228,376	27,319	1,530	19,943	.. .	192,068
136	Canned pork,	lb.	3,096,247	1,404	289	312	.....	4,087
137	Bacon	lb.	194,448,815	88,202	8,291	52,391	.....	522,095
138	Hams and shoulders	lb.	170,407,206	77,296	10,358	25,507	.....	280,150
139	Lard	lb.	486,169,008	220,525	.....	220,525	.....	2,051,633
140	Neutral lard	lb.	29,323,786	13,301	.....	13,301	.....	123,746
141	Lard compounds	lb.	67,185,508	30,475	.....	30,475	.....	283,523
142	Sausage*	lb.	6,420,363	2,912	622	898	14	10,962
143	Mutton	lb.	4,685,496	2,125	277	510	.....	5,880
144	Stearin from animal fats	lb.	2,724,181	1,236	.....	1,236	.....	11,496
145	Tallow	lb.	15,812,831	7,173	.....	7,173	.....	66,730
146	Oleo oil	lb.	97,017,065	44,007	.....	44,007	.....	409,412
147	Oleomargarine	lb.	2,554,045	1,159	14	961	.....	9,003
	Sub-total—Meats	....	.....	533,558	23,612	422,528	14	4,029,236
	Poultry and Eggs							
148	Eggs	doz.	16,367,399	11,137	1,455	1,039	.....	15,598
	Dairy Products							
149	Butter	lb.	4,713,535	2,138	21	1,817	.....	16,992
150	Cheese	lb.	2,873,048	1,303	336	440	31	5,603
151	Milk, condensed and evaporated	lb.	21,230,088	9,630	886	847	3,139	24,414
	Sub-total—Dairy Products	....	.....	13,071	1,243	3,104	3,170	47,009
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	557,766	26,310	426,671	3,184	4,091,843

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37—*Continued*

Reference No.	Commodity	Original units	1914-15: Total domestic exports in original units	1914-15: Total domestic exports in metric tons	1914-15: Protein in metric tons	1914-15: Fat in metric tons	1914-15: Carbohydrate in metric tons	1914-15: Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	170,445,106	77,313	11,752	11,906	.....	159,366
132	Canned beef	lb.	75,419,035	34,210	8,963	6,364	.....	96,536
133	Pickled beef	lb.	31,933,357	14,485	1,622	5,765	.....	60,355
134	Fresh pork	lb.	3,908,193	1,773	238	429	.....	4,963
135	Pickled pork	lb.	59,607,617	27,038	1,513	19,737	.....	190,090
136	Canned pork	lb.	4,668,275	2,118	436	470	.....	6,162
137	Bacon	lb.	347,100,076	157,443	14,800	93,521	.....	931,963
138	Hams and shoulders	lb.	208,187,104	94,433	12,654	31,163	.....	342,259
139	Lard	lb.	479,570,482	217,532	.....	217,532	.....	2,023,788
140	Neutral lard	lb.	26,021,054	11,803	.....	11,803	.....	109,809
141	Lard compounds	lb.	78,981,482	35,826	.....	35,826	.....	333,304
142	Sausage*	lb.	7,512,555	3,407	724	1,049	17	12,788
143	Mutton	lb.	3,877,413	1,759	229	422	.....	4,866
144	Stearin from animal fats	lb.	11,457,907	5,197	.....	5,197	.....	48,352
145	Tallow	lb.	20,239,988	9,181	.....	9,181	.....	85,413
146	Oleo oil	lb.	80,481,946	36,506	.....	36,506	.....	339,634
147	Oleomargarine	lb.	5,252,183	2,382	29	1,978	.....	18,513
	Sub-total—Meats	....	.....	732,406	52,960	488,849	17	4,768,161
	Poultry and Eggs							
148	Eggs	doz.	21,013,025	14,298	1,868	1,335	.....	20,026
	Dairy Products							
149	Butter	lb.	10,993,012	4,986	49	4,238	.....	39,631
150	Cheese	lb.	56,079,758	25,437	6,563	8,598	610	109,356
151	Milk, condensed and evaporated	lb.	42,803,549	19,416	1,786	1,708	6,329	49,224
	Sub-total—Dairy Products	....	.....	49,839	8,398	14,544	6,939	198,211
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	796,543	63,226	504,728	6,956	4,986,398

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37—*Continued*

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
			1915–16					
	Meats and Derivative Products							
131	Fresh beef	lb.	232,036,013	105,251	15,998	16,208	.....	216,954
132	Canned beef	lb.	51,147,247	23,200	6,078	4,315	.....	65,469
133	Pickled beef	lb.	38,207,529	17,331	1,941	6,898	.....	72,212
134	Fresh pork	lb.	63,005,524	28,579	3,829	6,916	.....	80,018
135	Pickled pork	lb.	78,395,157	35,560	1,991	25,958	.....	250,003
136	Canned pork	lb.	9,654,931	4,379	902	972	.....	12,744
137	Bacon	lb.	580,519,966	263,323	24,752	156,413	.....	1,558,697
138	Hams and shoulders	lb.	286,772,746	130,079	17,430	42,925	.....	471,455
139	Lard	lb.	432,087,335	195,993	.....	195,993	.....	1,823,407
140	Neutral lard	lb.	34,426,590	15,616	.....	15,616	.....	145,282
141	Lard compounds	lb.	60,697,320	27,533	.....	27,533	.....	256,141
142	Sausage*	lb.	16,452,699	7,463	1,503	2,243	32	27,157
143	Mutton	lb.	5,552,918	2,519	327	604	.....	6,969
144	Stearin from animal fats	lb.	13,062,247	5,925	.....	5,925	.....	55,123
145	Tallow	lb.	16,288,743	7,389	.....	7,389	.....	68,740
146	Oleo oil	lb.	102,645,914	46,560	.....	46,560	.....	433,166
147	Oleomargarine	lb.	5,426,221	2,461	30	2,043	.....	19,127
	Sub-total—Meats	....	.....	919,161	74,781	564,511	32	5,562,664
	Poultry and Eggs							
148	Eggs	doz.	26,771,434	18,215	2,380	1,700	.....	25,514
	Dairy Products							
149	Butter	lb.	15,142,737	6,869	69	5,838	.....	54,588
150	Cheese	lb.	45,702,969	20,731	5,348	7,008	498	89,120
151	Milk, condensed and evaporated	lb.	165,295,109	74,977	6,898	6,598	24,442	190,089
	Sub-total—Dairy Products	....	.....	102,577	12,315	19,444	24,940	333,797
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	1,039,953	89,476	585,655	24,972	5,921,975

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37 —*Continued*

1916–17

Reference No.	Commodity	Original units	Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	197,760,237	89,704	13,634	13,815	.....	184,906
132	Canned beef	lb.	68,133,261	30,905	8,097	5,748	.....	87,210
133	Pickled beef	lb.	58,143,585	26,374	2,954	10,497	.....	109,892
134	Fresh pork	lb.	50,429,215	22,875	3,065	5,536	.....	64,045
135	Pickled pork	lb.	55,896,890	25,355	1,420	18,509	.....	178,256
136	Canned pork	lb.	5,921,594	2,686	553	597	.....	7,817
137	Bacon	lb.	667,765,219	302,896	28,472	179,919	.....	1,792,949
138	Hams and shoulders	lb.	271,199,400	123,016	16,484	40,595	.....	445,852
139	Lard	lb.	448,894,182	203,617	.....	203,617	.....	1,894,335
140	Neutral lard	lb.	17,548,259	7,960	.....	7,960	.....	74,053
141	Lard compounds	lb.	65,654,639	29,780	.....	29,780	.....	277,061
142	Sausage*	lb.	17,150,985	7,779	1,591	2,354	36	28,555
143	Mutton	lb.	3,195,576	1,450	189	347	.....	4,010
144	Stearin from animal fats	lb.	12,936,357	5,868	.....	5,868	.....	54,951
145	Tallow	lb.	15,209,873	6,899	.....	6,899	.....	64,186
146	Oleo oil	lb.	67,113,421	30,442	.....	30,442	.....	283,219
147	Oleomargarine	lb.	5,651,267	2,563	31	2,127	.....	19,920
	Sub-total—Meats	....	.....	920,169	76,490	564,610	36	5,571,217
	Poultry and Eggs							
148	Eggs	doz.	25,304,630	17,217	2,250	1,607	.....	24,115
	Dairy Products							
149	Butter	lb.	28,798,802	13,063	131	11,104	.....	103,819
150	Cheese	lb.	67,320,279	30,536	7,878	10,321	733	131,274
151	Milk, condensed and evaporated	lb.	265,796,134	120,565	11,092	10,609	39,303	305,666
	Sub-total—Dairy Products	....	.....	164,164	19,101	32,034	40,036	540,759
	Grand Total—Total Domestic Exports of Secondary Foods	...	.....	1,101,550	97,841	598,251	40,072	6,136,091

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

TABLE 37—*Continued*

Reference No.	Commodity	Original units	1917-18 ** Total domestic exports in original units	Total domestic exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Meats and Derivative Products							
131	Fresh beef	lb.	411,855,061	186,816	28,395	28,770	.....	385,085
132	Canned beef	lb.	153,144,265	69,466	17,544	11,843	276	184,162
133	Pickled beef	lb.	54,967,704	24,934	2,792	9,923	.....	103,889
134	Fresh pork	lb.	21,390,302	9,703	1,300	2,348	.....	27,166
135	Pickled pork	lb.	40,430,896	18,339	1,027	13,387	.....	128,934
136	Canned pork	lb.	5,217,296	2,366	487	525	.....	6,887
137	Bacon	lb.	843,482,929	382,601	35,965	227,265	.....	2,264,752
138	Hams and shoulders	lb.	422,832,166	191,796	25,700	63,292	.....	695,136
139	Lard	lb.	395,615,362	179,449	.....	179,449	.....	1,669,496
140	Neutral lard	lb.	4,258,529	1,932	.....	1,932	.....	17,971
141	Lard compounds	lb.	43,792,782	19,865	.....	19,865	.....	184,805
142	Sausage*	lb.	16,352,071	7,417	1,524	2,248	34	27,289
143	Mutton	lb.	2,098,423	952	124	228	.....	2,634
144	Stearin from animal fats	lb.	10,252,522	4,651	.....	4,651	.....	43,266
145	Tallow	lb.	5,014,964	2,275	.....	2,275	.....	21,163
146	Oleo oil	lb.	56,648,102	25,695	.....	25,695	.....	239,055
147	Oleomargarine	lb.	6,404,896	2,905	35	2,411	.....	22,577
	Sub-total—Meats	....	.....	1,131,162	114,893	596,107	310	6,024,267
	Poultry and Eggs							
148	Eggs	doz.	19,475,176	13,251	1,731	1,237	.....	16,560
	Dairy Products							
149	Butter	lb.	19,608,950	8,895	88	7,560	.....	70,690
150	Cheese	lb.	45,871,179	20,807	5,368	7,033	500	89,448
151	Milk, condensed and evaporated	lb.	536,086,804	243,167	22,371	21,399	79,272	616,491
	Sub-total—Dairy Products	....	.....	272,869	27,827	35,992	79,772	776,629
	Grand Total—Total Domestic Exports of Secondary Foods	....	.....	1,417,282	144,451	633,336	80,082	6,819,456

* This item includes "Canned Sausage" and "All other Sausage" of Table 37 (items 141 and 142) and "Sausage" of Table 39 (item 180).

** In the total domestic exports of the year 1917-18 are included the shipments to the American Expeditionary Forces abroad, as well as shipments to the Commission for Relief in Belgium and American Red Cross.

probably to be found in the generally more sprightly selling activity, following the war's beginning, by firms doing an export business in this country. Generally people nowadays buy not what they need or want but what somebody succeeds in selling them. Having one's selling hand in, through practice on the foreigner who really had enhanced needs for imported foods as soon as the war was under way, it is easily conceivable that our insular brothers have been oversold.

With Tables 35 and 37 in hand we may proceed to an examination of the course of the export movement of human foods produced in the United States during recent years. A summary table which makes such study possible is given as Table 38.

TABLE 38.—SUMMARY OF GROSS EXPORTS OF PRIMARY FOODS

(Metric Tons)

Year	Total of all primary food exports as commodity	Protein in primary food exports	Fat in primary food exports	Carbohydrate in primary food exports	Calories (millions) in primary food exports
1911–12	2,764,822	208,248	212,783	1,620,606	9,479,617
1912–13	4,499,719	357,741	188,287	2,547,330	13,664,695
1913–14	4,408,369	361,836	133,098	2,530,393	13,098,163
1914–15	9,796,896	795,328	229,242	5,586,014	28,300,616
1915–16	7,920,332	606,814	187,949	4,803,115	23,933,349
1916–17	6,785,362	524,513	135,432	4,087,852	20,174,512
1917–18	4,453,805	408,048	109,363	2,964,063	14,846,825
Total for 7 years	40,629,305	3,262,538	1,196,154	24,139,373	123,497,777
Average per year, whole, period	5,804,186	466,077	170,879	3,448,482	17,642,540
Average per year, 3 prewar years	3,890,970	309,275	178,056	2,232,776	12,080,825
Average per year, war period	7,239,099	583,678	165,496	4,360,261	21,813,825
Per cent. nutrients to total (and calories per lb.) 3 prewar years	.....	8.0	4.6	57.4	1408.3
Per cent. nutrients to total (and calories per lb.) war period	.....	8.1	2.3	60.2	1366.8
Per cent. nutrients to total (and calories per lb.) whole period	.....	8.0	2.9	59.4	1378.8

Table 38 brings out clearly the profound change wrought in our export trade in primary human foodstuffs by the war. In 1914–15, the first year of the war, our gross exports of the commodities here under consideration more than doubled in comparison with the previous year. Since 1914–15 the gross total exports of

primary foods from this country have steadily fallen, year by year, until in 1917–18 the figure was back nearly to the prewar average, and actually smaller than the exports of the same group of commodities in 1912–13. A study of Table 35 shows that this decline since the first year of the war is almost entirely accounted for in the first group of commodities, namely the grains and their derivative products. To be still more specific it is in the export of wheat and its products that the great change has been. In 1914–15 we exported 8,556,274 metric tons of wheat and wheat products (flour, bread and biscuit). Against this the highest previous export was in 1913–14, with a total gross export of the same products of 3,619,382 metric tons, or less than half as much. It is obvious *a priori* that the export pace for wheat set in 1914–15 could not possibly be maintained, since in that year the total was swelled enormously by drawing on stored reserves, which high prices brought to light. Reserves, invisible supplies and the like can be drawn on to the point of exhaustion just once. Thereafter exports must come each year out of the surplus of that year's crop over domestic needs. In just such manner did events follow in the case of wheat and its products. After the banner export year of 1914–15 the amount sent away from our shores was smaller each year, reaching in 1917–18 a total (again for the same three products, wheat, wheat flour, bread and biscuit) of 3,008,707 metric tons. To be sure almost all of this went in 1917–18 to the Allies, which in 1914–15 was very far indeed from being the case. We have no occasion, in short, to reproach ourselves with having failed to do our just part in feeding the Allies. The decline in wheat exports since 1914–15 merely means that in each succeeding year since then the total amount of invisible wheat in reserve in this country, which the glitter of foreign gold would alone bring forth, was getting nearer and nearer the vanishing point. Before the end of 1916–17 it was all gone. The wheat exports of 1917–18 came out of, first a small exportable surplus from the crop of the same year, and to a much larger degree from the savings resulting from conservation, guided and directed by the Food Administration, but actually accomplished by the housewives of America.

The course of events in the successive years is shown graphically in Fig. 14, for the total exports and the individual nutrients.

The next point of interest to which attention may be turned is the relation of gross exports to production. Table 39 gives the facts for primary human foods. For each year and each nutrient com-

pound, there is stated in this table the percentage which the total gross exports form of the total domestic production.

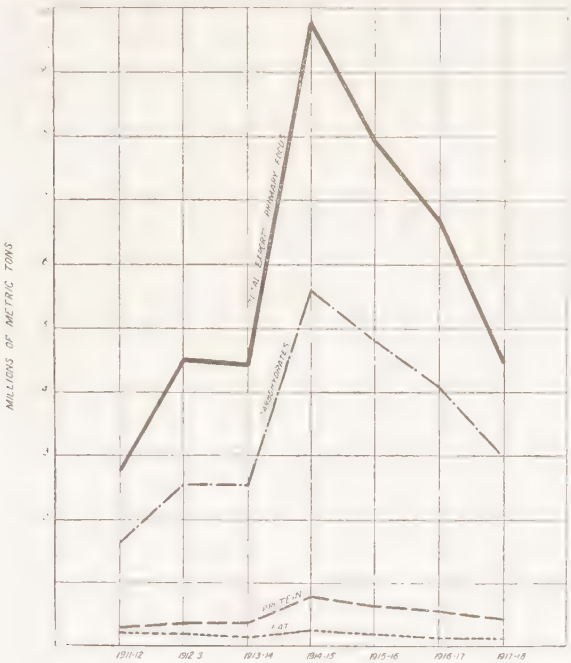

FIG. 14.—Showing the course of gross exports of primary food materials since 1911. Solid line denotes total primary food exports. Dash line, protein content; dot line, fat content; dash-dot line, carbohydrate content.

TABLE 39.—SHOWING THE PERCENTAGES OF THE TOTAL PRODUCTION OF PRIMARY HUMAN FOODS SENT AWAY FROM THE UNITED STATES AS GROSS EXPORTS

Year	Total primary foods	Protein	Fat	Carbohydrate	Calories
1911–12	8.6	12.1	22.5	12.4	13.6
1912–13	11.8	17.9	20.4	17.0	17.5
1913–14	12.3	17.8	14.0	16.7	16.5
1914–15	23.1	34.2	21.0	32.7	31.5
1915–16	17.7	23.3	20.4	25.2	24.6
1916–17	20.5	29.5	14.6	29.9	28.0
1917–18	12.1	20.8	10.7	19.9	18.9
Total 7 years	15.4	22.6	17.7	22.4	21.9
Three prewar years	11.0	16.1	19.0	15.5	16.0
War period	18.4	26.9	16.7	27.0	25.8

The results of the table are very striking. It is seen clearly how enormously our exports of primary human foods increased at the beginning of the war, in relation to production, in respect of all nutrients except fat. In the first year the ratio of exports to production about doubled for the total protein and carbohydrate. In the fat content of primary foods the ratio increased from the 1913–14 level to about what it was in 1911–12. In all cases the ratio fell off in 1915–16, because of the large production of that year, only to advance again in 1916–17. The latter year marked what is to be regarded as the most serious over-export in relation to production of any year of the war.

The situation in regard to the exports of fat in the form of primary foods, which includes all the vegetable fats used as human food, is interesting. In spite of the world shortage in fats the exports of this nutrient fell off markedly from the prewar average during the war period. As will presently appear, this was compensated for in the export of animal fats, but there is no apparent reason for the decline in the export-production ratio shown in the fat column of Table 39.

In 1917–18, our first year in the war, the export-production ratio fell back nearly to the prewar normal. This is unquestionably a healthy state of affairs at the beginning of a food exporting nation's participation in a great war. It means that we start off from an approximately normal base. If the exigencies of the occasion should demand it, a nation could later over-export in relation to production, just as we did in 1914–15. But at the end of 1917–18 we were clearly insured against any difficulty as to domestic needs because we were holding about a normal proportion of our food production in this country. It must again be emphasized, lest a wrong conclusion be drawn, that in 1917–18 practically our total food exports went to the Allies, instead of being distributed among many countries as in the prewar years. In other words, the decline of the export-production ratio in 1917–18 does not at all mean that we did not do our just part in feeding the Allies that year.

Another point which needs attention is the change in the nutrient concentration of our primary food exports in the war years as compared with prewar conditions. This matter will be more directly elucidated in a later table but the general drift of affairs is plain enough here. Comparing prewar and war averages it is seen that while the ratio of total primary food exports to production was

7.4 points higher in the war years than prewar, the protein export-production ratio advanced 10.8 points, the carbohydrate ratio 11.5 points, and the calorie ratio 9.8 points. Plainly more concentrated forms of primary foods were exported during the war period than in prewar years. This is of course as it should be. The fat content as before forms an exception. The export-production ratio for this nutrient was 2.3 points *lower* on the average in the war years than in the prewar years.

The general relations of the export-production ratio for primary human foods are shown graphically in Fig. 15 on a percentage basis.

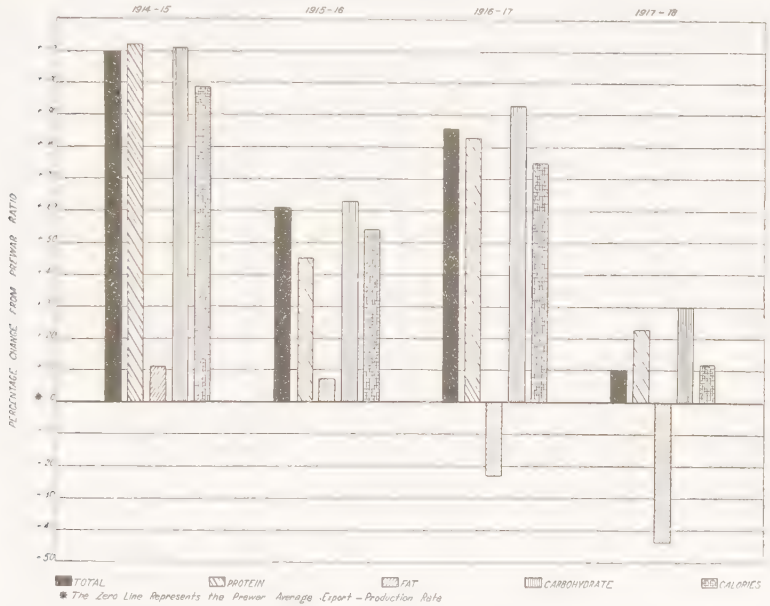

FIG. 15.—Showing the percentage changes during the successive years in the ratio between gross exports and production of nutrients in the United States in the form of primary human foods.

It is seen that with the single exception of fat the export-production ratio was above the prewar average in each year of the war, by amounts varying from as low as 10 per cent. to as high as 112 per cent. This diagram raises an interesting question. How long could the country continue exporting food at a higher ratio to production than the normal average? It seems fairly clear from the 1917–18 figures that we had then about reached the end of such

exportations, and must drop back to the normal export-production ratio. In the earlier years of the war there were large invisible reserves particularly of the grains which could be drawn on to increase the ratio. As already pointed out these had disappeared by 1917. It is certain that the 1917–18 bars would have been below the line instead of above it, had it not been for the Food Administration's conservation campaign.

We may next turn to a further consideration of the exports of secondary foods. Table 37 gives the combined gross exports of these foods to foreign countries and to insular possessions. The results of Table 37 are summarized by years in Table 40. This enables a direct examination of the course of the secondary food exports in successive years.

TABLE 40.—SUMMARY OF GROSS EXPORTS OF SECONDARY FOODS

(Metric Tons)

Year	Total of all secondary food exports as commodity	Protein in secondary food exports	Fat in secondary food exports	Carbohydrate in secondary food exports	Calories (millions) in secondary food exports
1911–12	670,713	32,843	509,521	3,906	4,892,666
1912–13	602,343	27,821	464,651	3,236	4,451,617
1913–14	557,766	26,310	426,671	3,184	4,091,843
1914–15	796,543	63,226	504,728	6,956	4,986,398
1915–16	1,039,953	89,476	585,655	24,972	5,921,975
1916–17	1,101,550	97,841	598,251	40,072	6,136,091
1917–18	1,417,282	144,451	633,336	80,082	6,819,456
Total for 7 years	6,186,150	471,968	3,722,813	162,408	37,300,046
Average per year, whole period	883,736	67,424	531,830	23,201	5,328,578
Average per year, 3 prewar years	610,274	28,991	466,948	3,442	4,478,708
Average per year, war period	1,088,832	98,748	580,493	38,021	5,965,980
Per cent. nutrients to total (and calories per lb.) 3 prewar years		4.8	76.5	0.56	3,329
Per cent. nutrients to total (and calories per lb.) war period		9.1	53.3	3.50	2,485
Per cent. nutrients to total (and calories per lb.) whole period		7.6	60.2	2.60	2,735

The course of the secondary food exports in successive years is shown graphically in Fig. 16, which is drawn on the same plan as Fig. 14.

It is at once apparent that the secondary food exports have followed a totally different course since 1911 to that shown in Fig.

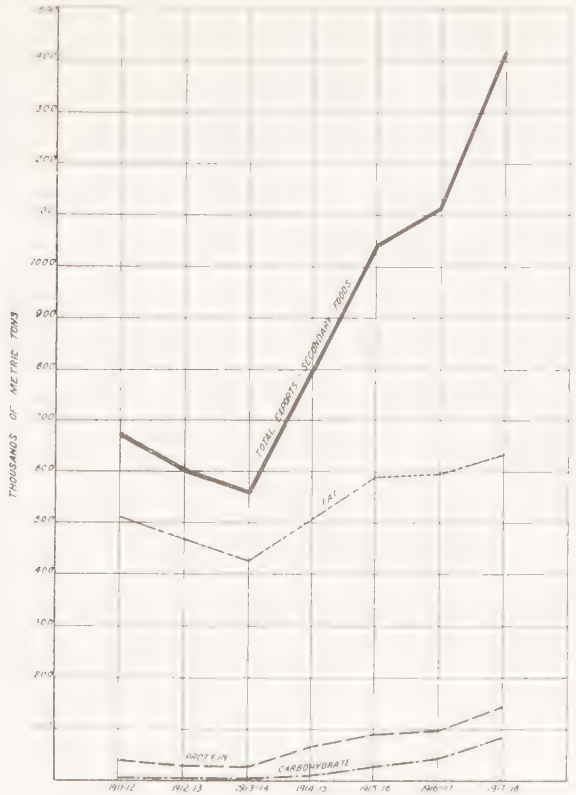

FIG. 16.—Showing the course of gross exports of secondary food materials since 1911. Solid line denotes total secondary food exports; dash line, protein content; dot line, fat content; dash-dot line, carbohydrate content.

14 for the primary food exports. The overseas shipments of secondary food products were in process of steady decline before the war, reaching a minimum in 1913-14, the year immediately preceding the outbreak of hostilities. With that event began a marked rise in the curve, which has continued throughout the war, reaching a maximum (to date) in 1917–18. There is thus exhibited a beautiful compensatory behavior between primary and secondary

food exports. During the war period, as has been seen, the former decreased sharply, while the latter increased. The net combined result will be shown in a later table.

It is noteworthy that the export of fat in secondary foods during the war years has not kept pace with the total export of such foods. There is a distinct and increasing lag each year. In other words, our secondary food exports have been progressively less rich in fat during the war period. This has been due to the combined operation of two factors: first, an actual diminution in shipments of the more important pure animal fats such as lard; and, second, an increase in the proportion to the total secondary exports of the less fatty products, as for example meat and milk.

The change in the carbohydrate content of the secondary exports, which represents almost entirely the sugar in condensed milk, is most striking. The exports of condensed milk have increased so enormously in the past few years as to result in a total carbohydrate content of the secondary food exports more than 10 times as great in the war period as prevailed in prewar years. In 1917–18 we have the extraordinary result that in the total secondary food exports—animal products—there were something over one-half as many tons of carbohydrate as of protein.

The next point of interest is the relation of secondary food exports to the total domestic production of the same commodities. The necessary data are given in Table 41.

TABLE 41.—SHOWING THE PERCENTAGES OF THE TOTAL PRODUCTION OF SECONDARY HUMAN FOODS SENT AWAY FROM THE UNITED STATES AS GROSS EXPORTS

Year	Total secondary foods	Protein	Fat	Carbohydrate	Calories
1911–12	1.3	1.7	11.0	0.4	8.9
1912–13	1.2	1.4	10.3	0.4	8.3
1913–14	1.1	1.4	9.7	0.4	7.8
1914–15	1.5	3.2	10.5	0.8	8.8
1915–16	1.9	4.3	11.8	2.6	10.1
1916–17	2.0	4.6	11.9	4.1	10.3
1917–18	2.5	6.8	12.6	8.0	11.4
Total, 7 years	1.7	3.3	11.2	2.5	9.4
Three prewar years	1.2	1.5	10.3	0.4	8.3
War period	2.0	4.7	11.7	4.0	10.2

From this table the following points appear:

1. There was in general a marked increase in the export-production ratio with the beginning of the war, in the case of secondary foods just as in the case of primary. This was true for all nutrients except fat.

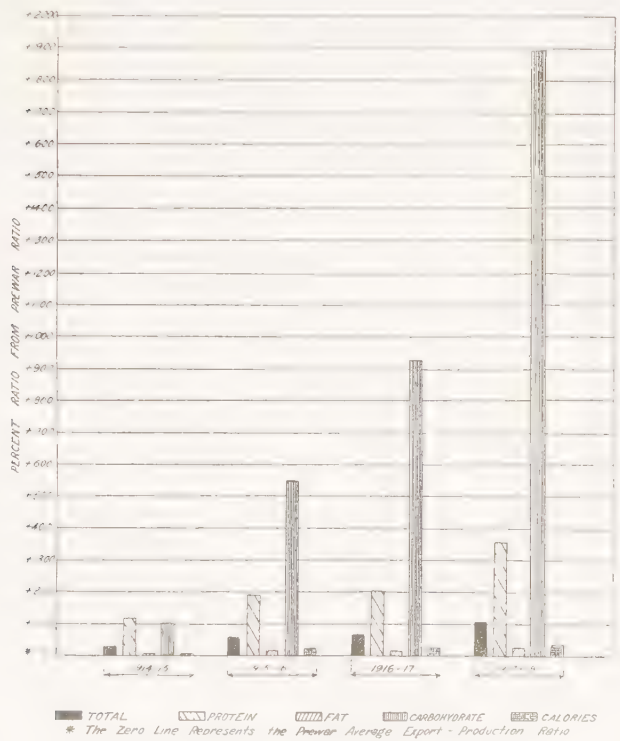

FIG. 17.—Showing the percentage changes, during successive years, in the ratio between gross exports and the production of nutrients in the United States, in the form of secondary human foods.

2. By comparing Table 41 with Table 39 it is apparent that, even at the highest point, the export-production ratio is much smaller for secondary foods than for primary. In other words we export a much larger proportion of our production of primary foods than we do of secondary. The actual comparisons for the average of the whole 7 year period are: For total food, 15.4 per cent. to 1.7 per cent.; for protein, 22.6 per cent. to 3.3 per cent.; for fat, 17.7 per cent. to 11.2 per cent.; for carbohydrate, 22.4 per cent. to 2.5 per cent.; for calories, 21.9 per cent. to 9.4 per cent.

3. The fat in secondary food exports shows the least relative change in the export-production ratio in the war period as compared with the prewar period, and carbohydrate shows the greatest relative change. This is clearly shown in Fig. 17, which is drawn on the same plan as Fig. 15 for primary foods.

It is evident from this diagram that the relative increases during the war period in the export-production ratio were, on the whole, much greater in the secondary than in the primary foods, though the ratios themselves were absolutely higher in the latter group. The changes in the export-production ratio for protein and carbohydrate in secondary foods were enormous.

It will be of interest next to combine the gross exports of primary and secondary foods in a grand total, in order that the general trend of all human food exports from this country during the war may be seen. This is done in Table 42, which combines into a single series of totals the data of Tables 38 and 40.

By comparing this table with Table 14 in Chapter V it is seen at once that the contribution of primary and secondary foods in the exports is very different from what it is in production. Whereas of the total human food produced 58 per cent. is of secondary origin, only 13 per cent. of the exported food is secondary. A considerably larger proportion of the exported fat is of primary origin than in the production. Of the total calories exported 77 per cent. are of primary origin, while of the total calories produced 59 per cent. are primary. In short, primary foods are exported in higher proportion to secondary than they are produced.

The changes in human food exports as a result of the war are shown in total in Table 42. Taking the four war years as compared with the three prewar it is seen that the total food, protein and carbohydrate exports about doubled in the war period. The fat exports increased about one-sixth. The exported calories nearly doubled. These facts enable us to form a picture of the significance of our food exportation during the war. While our average annual food *exports* nearly doubled during the war period, the average annual food *production* in this country increased in the same period less than 10 per cent. But percentages on such different bases may be misleading. Figures 18 and 19 show graphically the true relation between production and export of human foods.

TABLE 42.—TOTAL GROSS EXPORTS OF HUMAN FOOD FROM THE UNITED STATES
(Metric Tons)

Year	Total of all human food exported	Per cent. from: Primary	Per cent. from: Secondary	Total exported protein	Per cent. from: Primary	Per cent. from: Secondary	Total exported fat	Per cent. from: Primary	Per cent. from: Secondary	Total exported carbohydrate	Per cent. from: Primary	Per cent. from: Secondary	Total exported calories	Per cent. from: Primary	Per cent. from: Secondary
1911–12	3,435,535	80	20	241,091	86	14	722,304	29	71	1,624,512	99.8	0.2	14,372,283	66	34
1912–13	5,102,062	88	12	385,562	93	7	652,938	29	71	2,550,566	99.9	0.1	18,116,312	75	25
1913–14	4,966,135	89	11	388,146	93	7	559,769	24	76	2,533,577	99.9	0.1	17,190,006	76	24
1914–15	10,593,439	92	8	858,564	93	7	733,970	31	69	5,592,970	99.9	0.1	33,287,014	85	15
1915–16	8,960,285	88	12	696,290	87	13	773,604	24	76	4,828,087	99.5	0.5	29,855,324	80	20
1916–17	7,886,912	86	14	622,354	84	16	733,683	18	82	4,127,924	99.0	1.0	26,310,603	77	23
1917–18	5,871,087	76	24	552,499	74	26	742,699	15	85	3,044,145	97.4	2.6	21,666,281	69	31
Total for 7 years	46,815,455	87	13	3,744,506	87	13	4,918,967	24	76	24,301,781	99.3	0.7	160,797,823	77	23
Annual average, whole period	6,687,922	87	13	534,929	87	13	702,710	24	76	3,471,683	99.3	0.7	22,971,118	77	23
Annual average, 3 prewar years	4,501,244	86	14	338,266	91	9	645,004	28	72	2,236,218	99.8	0.2	16,559,534	73	27
Annual average, war period	8,327,931	87	13	682,427	86	14	745,989	22	78	4,398,282	99.1	0.9	27,779,806	79	21
Per cent. of nutrients to total, prewar	.....	..	..	7.5	..	..	14.3	..	..	49.7	....	...	1668.7	....	....
Per cent. of nutrients to total, war	.....	..	..	8.2	..	..	9.0	..	..	52.8	....	...	1513.1	....	....
Per cent. of nutrients to total, whole period	.....	..	..	8.0	..	..	10.5	..	..	51.9	....	...	1558.0		

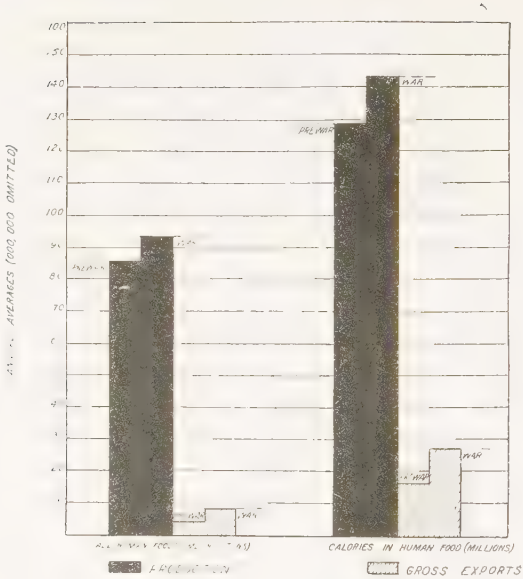

FIG. 18.—Diagram showing the relation between annual average production and annual average gross exportation of all human foods and their calory content, in prewar years and in the war period.

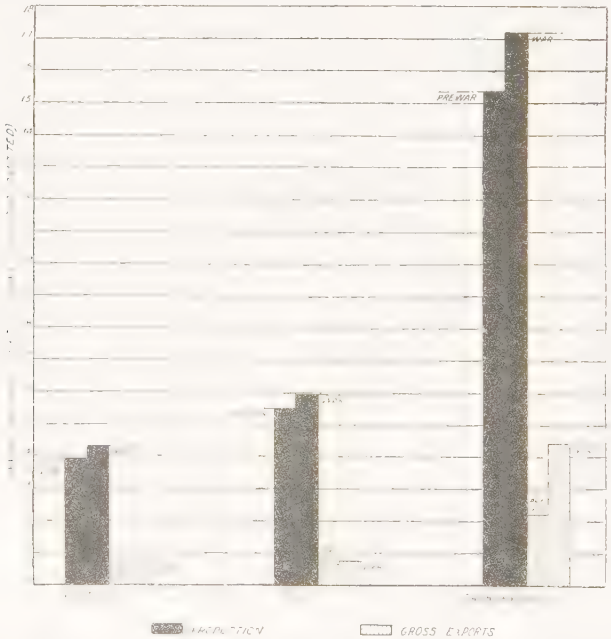

FIG. 19.—Diagram showing the relation between annual average production and annual average gross exportation of protein, fat and carbohydrate in human foods in prewar years and in the war period.

From these diagrams it is evident that the average annual excess of gross human food exports in the war period over prewar was not generally greater, and was in some cases distinctly smaller than the average annual excess in production in the war period as compared with the prewar. To make the comparison precise on this point, and also introduce the year 1917–18, Table 43 has been prepared.

TABLE 43.—COMPARING THE ABSOLUTE EXCESS IN AVERAGE ANNUAL EXPORTATION OF HUMAN FOODS WITH THE EXCESS IN PRODUCTION OF THE SAME FOODS IN THE WAR PERIOD AND THE PREWAR PERIOD

Item	Absolute excess in war period as compared with prewar period in average annual		Absolute excess in 1917–18 as compared with prewar average annual	
	Production	Gross exportation	Production	Gross exportation
Total human food (metric tons)	8,033,858	3,826,678	7,460,379	1,369,843
Protein content (metric tons)	395,512	344,161	233,921	214,233
Fat content (metric tons)	490,390	100,985	605,498	97,695
Carbohydrate content (metric tons)	1,855,113	2,162,064	541,494	807,927
Calories (millions)	13,752,898	11,220,272	8,817,732	5,106,747

It is clear from this table that the excess of domestic production of human foods during the war period was *not* entirely exported, save in the case of carbohydrate. There has been, of course, a larger and a more prosperous domestic population during the war period than prewar, and this will account for some of the difference—probably for all of it and even more in the case of protein. But the broad fact is that while it is true that we doubled our exports of human food while production increased less than 10 per cent., and furthermore notably increased the export-production ratio, there nevertheless remained in the country more tons of human food (with the exception of carbohydrate) during the war period than did in the three years preceding the war. The case in 1917–18 was in some respects worse than for the whole war period and in some respects better. It was chiefly better in two respects: First, the concentration of nutrients of the exported human foods was high in 1917–18 (compare calories with total food in last two columns of Table 43); and, second, in that virtually all the exports in 1917–18 went to the Allies. The latter is the really outstanding feature of the case.

The relative concentration of nutrients in exported human foods is much greater than in the total production, as would be expected. The calory content of exported foods is rather more than double that of all foods domestically produced.

Figure 20 shows graphically the course of the export movements in the successive years.

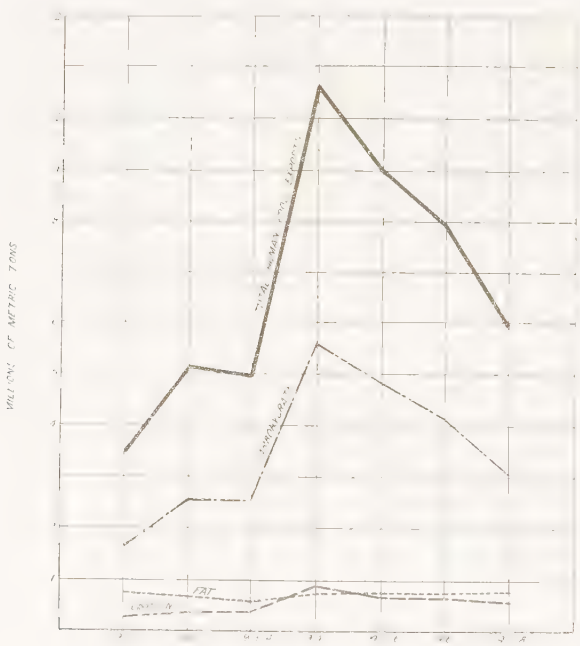

FIG. 20.—Showing the course of total human food exports since 1911. Solid line denotes total human food exports. Dash line, protein content; dot line, fat content; dash-dot line, carbohydrate content.

From this diagram it is evident that the compensatory increase in secondary food exports during the war years was not sufficient in magnitude to offset the downward tendency of the primary food exports. The fat exports form a nearly horizontal line.

Consideration may next be given the question of the relative importance of the different human food commodities and groups of commodities in the exports. In approaching this matter it has seemed best to use averages for the prewar period (3 years) and the war period (4 years) rather than to take an average of the whole

seven years, as was done for production. The reason obviously is because the volume of the exports was so violently changed by the war, while the changes in production are only such as might happen at any time one had a succession of two or three good crop years.

Tables 44 to 47 give the group averages and percentages for the different nutrients, as well as the cumulated percentages.

TABLE 44.—GROSS EXPORTS OF PROTEIN IN ALL HUMAN FOODS, ARRANGED BY COMMODITY GROUPS, IN DESCENDING ORDER OF IMPORTANCE

Group	Annual average during prewar period			Annual average during war period		
	Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.	Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.
Grains	293,047	86.632	86.632	550,967	80.736	80.736
Meats	25,922	7.663	94.295	79,781	11.691	92.427
Fish	8,598	2.542	96.837	16,910	2.478	94.905
Vegetables	4,444	1.314	98.151	14,174	2.077	96.982
Fruits	2,400	0.710	98.861	13,989	2.050	99.032
Poultry and eggs	1,559	0.461	99.322	2,349	0.344	99.376
Dairy products	1,510	0.446	99.768	2,189	0.321	99.697
Oils and nuts	783	0.231	99.999	2,057	0.301	99.998
Sugars	3	0.001	100.000	12	0.002	100.000
Totals	338,266	100.000	.....	682,428	100.000	

The overwhelming importance of the grains in furnishing protein in our human food exports is clear. This commodity group furnished 87 per cent. of the protein in the exports before the war, and 81 per cent. during the war period. The contribution to protein exports by the meats rose in the war period to 12 per cent., from the 7 per cent. which it had been before. In the prewar period dairy products had stood in the seventh place, contributing less than a half of our per cent. of the exported protein (in human foods). During the war period the dairy products rose to third place, furnishing nearly two and a half per cent. of the total exported protein. This is the most notable change in position in the table. The fruits and fish, low in nutrient concentration, dropped down in relative position in the table during the war years, as would have been expected.

TABLE 45.—GROSS EXPORTS OF FAT IN ALL HUMAN FOODS, ARRANGED BY COMMODITY GROUPS, IN DESCENDING ORDER OF IMPORTANCE

Group	Annual average during prewar period			Annual average during war period		
	Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.	Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.
Meats	462,081	71.64	71.64	553,519	74.20	74.20
Oils and nuts	145,266	22.52	96.16	102,740	13.77	87.97
Grains	28,057	4.35	98.51	55,185	7.40	95.37
Dairy products	3,753	0.58	99.09	25,503	3.42	98.79
Fish	3,142	0.49	99.58	5,200	0.70	99.49
Fruits	1,289	0.20	99.78	1,470	0.20	99.69
Poultry and eggs	1,114	0.17	99.95	1,431	0.19	99.88
Vegetables	303	0.05	100.00	941	0.12	100.00
Sugars	0	0.00	100.00	0	0.00	100.00
Totals	645,005	100.00	.....	745,989	100.00	

TABLE 46.—GROSS EXPORTS OF CARBOHYDRATE IN ALL HUMAN FOODS, ARRANGED BY COMMODITY GROUPS, IN DESCENDING ORDER OF IMPORTANCE

Group	Annual average during prewar period			Annual average during war period		
	Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.	Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.
Grains	1,952,095	87.294	87.294	3,659,603	83.205	83.205
Sugars	191,939	8.583	95.877	586,653	13.339	96.544
Fruits	69,272	3.098	98.975	59,642	1.356	97.900
Vegetables	18,693	0.836	99.811	51,064	1.161	99.061
Dairy products	3,424	0.153	99.964	37,922	0.862	99.923
Oils and nuts	777	0.035	99.999	3,300	0.075	99.998
Meats	18	0.001	100.000	99	0.002	100.000
Fish	0	0.000	100.000	0	0.000	100.000
Poultry and eggs	0	0.000	100.000	0	0.000	100.000
Totals	2,236,218	100.000	.....	4,398,283	100.000	

In the fat exports of human foods the oils and nuts, without changing their relative position, lost in percentage contribution to total, and the grains and dairy products gained, the latter notably. The meat group also gained, and is, of course, outstanding in its contribution to total fat exports. The three groups, meats, oils and nuts, and grains, together contribute 95 to 99 per cent. of our total fat exports in human foods.

In carbohydrate exports the grains, of course, come first. Their percentage contribution dropped somewhat, however, during the war period. The sugar made a notable gain in percentage contribution during the war, while the fruits fell off as would be expected.

TABLE 47.—CALORY CONTENT OF ALL EXPORTED HUMAN FOODS, ARRANGED BY COMMODITY GROUPS, IN DESCENDING ORDER OF IMPORTANCE

Group	Annual average during prewar period			Annual average during war period		
	Total (millions of) calories	Per cent. of total calories	Cumulated per cent	Total (millions of) calories	Per cent. of total calories	Cumulated per cent.
Grains	9,468,253	57.18	57.18	17,780,773	64.01	64.01
Meats	4,406,817	26.61	83.79	5,481,577	19.73	83.74
Oils and nuts	1,358,004	8.20	91.99	2,405,689	8.66	92.40
Sugars	787,095	4.75	96.74	979,087	3.53	95.93
Fruits	305,385	1.85	98.59	462,349	1.66	97.59
Vegetables	97,700	0.59	99.18	276,274	0.99	98.58
Fish	64,389	0.39	99.57	266,453	0.96	99.54
Dairy products	55,176	0.33	99.90	105,550	0.38	99.92
Poultry and eggs	16,715	0.10	100.00	22,054	0.08	100.00
Totals	16,559,534	100.00	.....	27,779,806	100.00	

Here in final summary it is seen that the grains and meats contribute together about 84 per cent. of the total energy value of the human food exports. They contributed this proportion before the war, and almost identically the same proportion since, what one group lost the other having gained. During the war dairy products moved up to fifth place, from eighth where it had been before.

Tables 48 to 51 give the relative nutritional importance of individual commodities in the total human food exportation. This is of considerable interest in comparison with the similar tables for production given in Chapter V and consumption in Chapter IX.

TABLE 48.—GROSS EXPORTS OF PROTEIN IN ALL HUMAN FOODS, ARRANGED BY COMMODITIES, IN DESCENDING ORDER OF IMPORTANCE

Order No.	Commodity	Annual average during prewar period		
		Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.
1	Wheat (nutrients in flour)	161,061	47.614	47.614
2	Wheat flour	120,444	35.606	83.220
3	Hams and shoulders	10,990	3.249	86.469
4	Bacon	8,605	2.544	89.013
5	Rice	5,836	1.725	90.738
6	Canned salmon	5,672	1.677	92.415
7	Beans and dried peas	3,272	0.967	93.382
8	Cornmeal and corn flour	2,966	0.877	94.259
9	Cured fish	2,244	0.663	94.922
10	Oatmeal and rolled oats	1,829	0.541	95.463
11	Pickled pork	1,664	0.492	95.955
12	Eggs	1,559	0.461	96.416
13	Pickled beef	1,504	0.445	96.861
14	Potatoes (except sweet)	1,003	−0.297	97.158
15	Milk, condensed and evaporated	952	0.281	97.439
16	Canned beef	897	0.265	97.704
17	Bread and biscuit	874	0.258	97.962
18	Sausage	739	0.218	98.180
19	Prunes, dried	715	0.211	98.391
20	Fresh beef	672	0.199	98.590
21	Peanuts	624	0.184	98.774
22	Cheese	533	0.158	98.932
23	Apricots, dried	458	0.135	99.067
24	Pickled fish	424	0.125	99.192
25	Canned pork	411	−0.122	99.314
26	Apples, green and ripe	338	0.100	99.414
27	Apples, dried	312	0.092	99.506
28	Mutton	266	0.079	99.585
29	Fresh fish	258	0.076	99.661
30	Raisins, dried	213	0.063	99.724
31	Onions	170	0.050	99.774
32	Oranges	161	0.048	99.822
33	Cocoa and chocolate, manufactured	159	0.047	99.869
34	Fresh pork	157	−0.047	99.916
35	Peaches, dried	123	0.036	99.952
36	Pears	81	0.024	99.976
37	Rye flour	36	0.011	99.987
38	Butter	25	+0.007	99.994
39	Oleomargarine	17	0.005	99.999
40	Honey	3	0.001	100.000
	Glucose	0	0	100.000
	Grape sugar	0	0	100.000
	Molasses	0	0	100.000
	Molasses and syrup	0	0	100.000
	Syrup	0	0	100.000
	Refined sugar	0	0	100.000
	Corn oil	0	0	100.000
	Cottonseed oil	0	0	100.000
	Lard	0	0	100.000
	Neutral lard	0	0	100.000
	Lard compounds	0	0	100.000
	Stearin from animal fats	0	0	100.000
	Tallow	0	0	100.000
	Oleo oil	0	0	100.000
	Total	338,267	100.000	

TABLE 48—*Continued*

Order No.	Commodity	Annual average during war period		
		Total protein (metric tons)	Per cent. of total protein	Cumulated per cent.
1	Wheat (nutrients in flour)	348,023	50.998	50.998
2	Wheat flour	173,104	25.366	76.364
3	Bacon	25,997	3.810	80.174
4	Hams and shoulders	18,067	2.647	82.821
5	Fresh beef	17,445	2.556	85.377
6	Beans and dried peas	12,135	1.778	87.155
7	Oatmeal and rolled oats	10,761	1.577	88.732
8	Milk, condensed and evaporated	10,537	1.544	90.276
9	Canned salmon	10,413	1.526	91.802
10	Rice	10,341	1.515	93.317
11	Canned beef	10,171	1.490	94.807
12	Cheese	6,289	0.922	95.729
13	Cornmeal and corn flour	6,177	0.905	96.634
14	Cured fish	2,828	0.414	97.048
15	Pickled beef	2,327	0.341	97.389
16	Fresh pork	2,108	0.309	97.698
17	Eggs	2,057	0.301	97.999
18	Potatoes	1,814	0.266	98.265
19	Rye flour	1,689	0.248	98.513
20	Pickled pork	1,488	0.218	98.731
21	Sausage	1,335	0.196	98.927
22	Cocoa and chocolate, manufactured	1,261	0.185	99.112
23	Peanuts	1,088	0.159	99.271
24	Bread and biscuit	871	0.128	99.399
25	Canned pork	595	0.087	99.486
26	Raisins, dried	519	0.076	99.562
27	Fresh fish	406	0.060	99.622
28	Prunes, dried	396	0.058	99.680
29	Pickled fish	341	0.050	99.730
30	Apricots, dried	327	0.048	99.778
31	Apples, green and ripe	309	0.045	99.823
32	Onions	225	0.033	99.856
33	Peaches, dried	220	0.032	99.888
34	Mutton	217	0.032	99.920
35	Oranges	204	0.030	99.950
36	Apples, dried	131	0.019	99.969
37	Butter	84	0.012	99.981
38	Pears	82	0.012	99.993
39	Oleomargarine	31	0.005	99.998
40	Honey	12	0.002	100.000
	Glucose	0	0	100.000
	Grape sugar	0	0	100.000
	Molasses	0	0	100.000
	Molasses and syrup	0	0	100.000
	Syrup	0	0	100.000
	Refined sugar	0	0	100.000
	Corn oil	0	0	100.000
	Cottonseed oil	0	0	100.000
	Lard	0	0	100.000
	Neutral lard	0	0	100.000
	Lard compounds	0	0	100.000
	Stearin from animal fats	0	0	100.000
	Tallow	0	0	100.000
	Oleo oil	0	0	100.000
	Total	682,425	100.000	

TABLE 49.—GROSS EXPORTS OF FAT IN ALL HUMAN FOODS, ARRANGED BY COMMODITIES, IN DESCENDING ORDER OF IMPORTANCE

Order No.	Commodity	Annual average during prewar year		
		Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.
1	Lard	233,438	36.192	36.192
2	Cottonseed oil	134,655	20.877	57.069
3	Bacon	54,379	8.431	65.500
4	Oleo oil	47,829	7.415	72.915
5	Lard compounds	32,550	5.046	77.961
6	Hams and shoulders	27,066	4.196	82.157
7	Pickled pork	21,688	3.362	85.519
8	Neutral lard	20,626	3.198	88.717
9	Wheat (nutrients in flour)	14,141	2.192	90.909
10	Tallow	12,981	2.013	92.922
11	Wheat flour	10,565	1.638	94.560
12	Corn oil	9,185	1.424	95.984
13	Pickled beef	5,344	0.828	96.812
14	Canned salmon	2,222	0.344	97.156
15	Butter	2,145	0.333	97.489
16	Cornmeal and corn flour	1,661	0.258	97.747
17	Stearin from animal fats	1,432	0.222	97.969
18	Oleomargarine	1,159	0.180	98.149
19	Eggs	1,114	0.173	98.322
20	Peanuts	1,068	0.166	98.488
21	Sausage	1,056	0.164	98.652
22	Milk, condensed and evaporated	911	0.141	98.793
23	Oatmeal and rolled oats	813	0.126	98.919
24	Bread and biscuit	726	0.113	99.032
25	Cured fish	713	0.111	99.143
26	Cheese	698	0.108	99.251
27	Fresh beef	680	0.105	99.356
28	Canned beef	637	0.099	99.455
29	Mutton	491	0.076	99.531
30	Canned pork	443	0.069	99.600
31	Apples, dried	428	0.066	99.666
32	Cocoa and chocolate, manufactured	358	0.055	99.721
33	Apples, green and ripe	338	0.052	99.773
34	Raisins, dried	290	0.045	99.818
35	Fresh pork	282	0.044	99.862
36	Beans and dried peas	211	0.033	99.895
37	Rice	145	0.022	99.917
38	Pickled fish	135	0.021	99.938
39	Apricots, dried	100	0.015	99.953
40	Fresh fish	72	0.011	99.964
41	Pears	65	0.010	99.974
42	Potatoes (except sweet)	56	0.009	99.983
43	Oranges	40	0.006	99.989
44	Onions	36	0.006	99.995
45	Peaches, dried	27	0.004	99.999
46	Rye flour	5	0.001	100.000
	Glucose	0	0	100.000
	Grape sugar	0	0	100.000
	Honey	0	0	100.000
	Molasses	0	0	100.000
	Molasses and syrup	0	0	100.000
	Syrup	0	0	100.000
	Refined sugar	0	0	100.000
	Prunes, dried	0	0	100.000
	Total	645,004	100.000	

TABLE 49—*Continued*

Order No.	Commodity	Annual average during war period		
		Total fat (metric tons)	Per cent. of total fat	Cumulated per cent.
1	Lard	199,148	26.696	26.696
2	Bacon	164,279	22.022	48.718
3	Cottonseed oil	93,881	12.585	61.303
4	Hams and shoulders	44,494	5.964	67.267
5	Oleo oil	34,801	4.665	71.932
6	Wheat (nutrients in flour)	30,554	4.096	76.028
7	Lard compounds	28,251	3.787	79.815
8	Pickled pork	19,398	2.600	82.415
9	Fresh beef	17,675	2.369	84.784
10	Wheat flour	15,185	2.036	86.820
11	Milk, condensed and evaporated	10,079	1.351	88.171
12	Neutral lard	9,328	1.250	89.421
13	Pickled beef	8,271	1.109	90.530
14	Cheese	8,240	1.104	91.634
15	Butter	7,185	0.963	92.597
16	Canned beef	7,067	0.947	93.544
17	Tallow	6,436	0.863	94.407
18	Stearin from animal fats	5,410	0.725	95.132
19	Oatmeal and rolled oats	4,783	0.641	95.773
20	Corn oil	4,153	0.557	96.330
21	Canned salmon	4,079	0.547	96.877
22	Fresh pork	3,807	0.510	97.387
23	Cornmeal and corn flour	3,459	0.464	97.851
24	Cocoa and chocolate, manufactured	2,844	0.381	98.232
25	Oleomargarine	2,140	0.287	98.519
26	Sausage	1,973	0.264	98.783
27	Peanuts	1,862	0.250	99.033
28	Eggs	1,470	0.197	99.230
29	Cured fish	898	0.120	99.350
30	Beans and dried peas	791	0.106	99.456
31	Bread and biscuit	723	0.097	99.553
32	Raisins, dried	708	0.095	99.658
33	Canned pork	641	0.086	99.734
34	Mutton	400	0.054	99.788
35	Apples, green and ripe	309	0.041	99.829
36	Rice	258	0.035	99.864
37	Rye flour	223	0.030	99.894
38	Apples, dried	179	0.024	99.918
39	Fresh fish	113	0.015	99.933
40	Pickled fish	109	0.015	99.948
41	Potatoes	101	0.014	99.962
42	Apricots, dried	71	0.009	99.971
43	Pears	66	0.009	99.980
44	Oranges	51	0.007	99.987
45	Onions	49	0.007	99.994
46	Peaches, dried	47	0.006	100.000
	Glucose	0	0	100.000
	Grape sugar	0	0	100.000
	Honey	0	0	100.000
	Molasses	0	0	100.000
	Molasses and syrup	0	0	100.000
	Syrup	0	0	100.000
	Refined sugar	0	0	100.000
	Prunes, dried	0	0	100.000
	Total	745,989	100.000	

TABLE 50.—GROSS EXPORTS OF CARBOHYDRATE IN ALL HUMAN FOODS, ARRANGED BY COMMODITIES, IN DESCENDING ORDER OF IMPORTANCE

Order No.	Commodity	Annual average during prewar period		
		Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.
1	Wheat (nutrients in flour)	1,061,008	47.447	47.447
2	Wheat flour	793,447	35.482	82.929
3	Syrup	69,534	3.109	86.038
4	Rice	57,624	2.577	88.615
5	Glucose	57,504	2.571	91.186
6	Refined sugar	33,533	1.500	92.686
7	Cornmeal and corn flour	26,063	1.165	93.851
8	Prunes, dried	24,692	1.104	94.955
9	Grape sugar	16,978	0.759	95.714
10	Molasses	13,688	0.612	96.326
11	Apples, dried	12,892	0.577	96.903
12	Apples, green and ripe	12,186	0.545	97.448
13	Beans and dried peas	9,422	0.421	97.869
14	Potatoes (except sweet)	8,193	0.366	98.235
15	Oatmeal and rolled oats	7,613	0.340	98.575
16	Raisins, dried	6,640	0.297	98.872
17	Apricots, dried	6,231	0.279	99.151
18	Bread and butter	5,922	0.265	99.416
19	Milk, condensed and evaporated	3,374	0.151	99.567
20	Oranges	3,108	0.139	99.706
21	Pears	1,852	0.083	99.789
22	Peaches, dried	1,672	0.075	99.864
23	Onions	1,078	0.048	99.912
24	Honey	608	0.027	99.939
25	Peanuts	463	0.021	99.960
26	Rye flour	417	0.019	99.979
27	Cocoa and chocolate, manufactured	314	0.014	99.993
28	Molasses and syrup	94	0.004	99.997
29	Cheese	50	0.002	99.999
30	Sausage	18	0.001	100.000
	Corn oil	0	0	100.000
	Cottonseed oil	0	0	100.000
	Fresh fish	0	0	100.000
	Cured fish	0	0	100.000
	Pickled fish	0	0	100.000
	Canned salmon	0	0	100.000
	Fresh beef	0	0	100.000
	Canned beef	0	0	100.000
	Pickled beef	0	0	100.000
	Fresh pork	0	0	100.000
	Pickled pork	0	0	100.000
	Canned pork	0	0	100.000
	Bacon	0	0	100.000
	Hams and shoulders	0	0	100.000
	Lard	0	0	100.000
	Neutral lard	0	0	100.000
	Lard compounds	0	0	100.000
	Mutton	0	0	100.000
	Stearin from animal fats	0	0	100.000
	Tallow	0	0	100.000
	Oleo oil	0	0	100.000
	Oleomargarine	0	0	100.000
	Eggs	0	0	100.000
	Butter	0	0	100.000
	Total	2,236,218	100.000	

TABLE 50—*Continued*

Order No.	Commodity	Annual average during war period: Total carbohydrate (metric tons)	Per cent. of total carbohydrate	Cumulated per cent.
1	Wheat (nutrients in flour)	2,292,624	52.125	52.125
2	Wheat flour	1,140,361	25.927	78.052
3	Refined sugar	464,268	10.556	88.608
4	Rice	102,117	2.322	90.930
5	Cornmeal and corn flour	54,272	1.234	92.164
6	Glucose	50,600	1.150	93.314
7	Syrup	45,675	1.038	94.352
8	Oatmeal and rolled oats	44,771	1.018	95.370
9	Milk, condensed and evaporated	37,337	0.849	96.219
10	Beans and dried peas	34,819	0.792	97.011
11	Rye flour	19,554	0.445	97.456
12	Raisins, dried	16,193	0.368	97.824
13	Potatoes	14,812	0.337	98.161
14	Grape sugar	13,704	0.312	98.473
15	Prunes, dried	13,687	0.311	98.784
16	Apples, green and ripe	11,111	0.253	99.037
17	Molasses	9,924	0.226	99.263
18	Bread and biscuit	5,903	0.134	99.397
19	Apples, dried	5,401	0.123	99.520
20	Apricots, dried	4,453	0.101	99.621
21	Oranges	3,928	0.089	99.710
22	Peaches, dried	2,999	0.068	99.778
23	Cocoa and chocolate, manufactured	2,492	0.057	99.835
24	Honey	2,387	0.054	99.889
25	Pears	1,871	0.042	99.931
26	Onions	1,432	0.033	99.964
27	Peanuts	807	0.018	99.982
28	Cheese	585	0.013	99.995
29	Molasses and syrup	95	0.002	99.997
30	Canned beef	69	0.002	99.999
31	Sausage	30	0.001	100.000
	Corn oil	0	0	100.000
	Cottonseed oil	0	0	100.000
	Fresh fish	0	0	100.000
	Cured fish	0	0	100.000
	Pickled fish	0	0	100.000
	Canned salmon	0	0	100.000
	Fresh beef	0	0	100.000
	Pickled beef	0	0	100.000
	Fresh pork	0	0	100.000
	Pickled pork	0	0	100.000
	Canned pork	0	0	100.000
	Bacon	0	0	100.000
	Hams and shoulders	0	0	100.000
	Lard	0	0	100.000
	Neutral lard	0	0	100.000
	Lard compounds	0	0	100.000
	Mutton	0	0	100.000
	Stearin from animal fats	0	0	100.000
	Tallow	0	0	100.000
	Oleo oil	0	0	100.000
	Oleomargarine	0	0	100.000
	Eggs	0	0	100.000
	Butter	0	0	100.000
	Total	4,398,281	100.000	

TABLE 51.—CALORY CONTENT OF ALL EXPORTED HUMAN FOODS, ARRANGED BY COMMODITIES, IN DESCENDING ORDER OF IMPORTANCE

Order No.	Commodity	Annual average during prewar years		
		Total (millions of calories)	Per cent. of total calories	Cumulated per cent.
1	Wheat (nutrients in flour)	5,142,762	31.056	31.056
2	Wheat flour	3,845,833	23.224	54.280
3	Lard	2,171,769	13.115	67.395
4	Cottonseed oil	1,252,883	7.566	74.961
5	Bacon	541,895	3.272	78.233
6	Oleo oil	444,976	2.687	80.920
7	Lard compounds	302,825	1.829	82.749
8	Hams and shoulders	297,268	1.795	84.544
9	Syrup	285,127	1 722	86.266
10	Rice	262,302	1.584	87.850
11	Glucose	235,802	1.424	89.274
12	Pickled pork	208,872	1.261	90.535
13	Neutral lard	191,897	1.159	91.694
14	Refined sugar	137,508	0.830	92.524
15	Cornmeal and corn flour	134,489	0.812	93.336
16	Tallow	120,763	0.729	94.065
17	Prunes, dried	104,145	0.629	94.694
18	Corn oil	85,459	0.516	95.210
19	Grape sugar	69,636	0.421	95.631
20	Apples, dried	57,962	0.350	95.981
21	Molasses	56,128	0.339	96.320
22	Pickled beef	55,950	0.338	96.658
23	Apples, green and ripe	54,727	0.331	96.989
24	Beans and dried peas	54,018	0.326	97.315
25	Oatmeal and rolled oats	46,317	0.280	97.595
26	Canned salmon	43.831	0.265	97.860
27	Potatoes	38,226	0.231	98.091
28	Bread and biscuit	34,644	0.209	98.300
29	Raisins, dried	30,832	0.186	98.486
30	Apricots, dried	28,308	0.171	98.657
31	Milk, condensed and evaporated	26,241	0.158	98.815
32	Butter	20,055	0.121	98 936
33	Eggs	16,715	0.101	99.037
34	Cured fish	15,832	0.096	99.133
35	Peanuts	14,397	0.087	99.220
36	Oranges	13,612	0.082	99.302
37	Stearin from animal fats	13,320	0.080	99.382
38	Sausage	12,924	0.078	99.460
39	Oleomargarine	10,849	0.066	99.526
40	Canned beef	9,667	0.058	99.584
41	Fresh beef	9,106	0.055	99.639
42	Cheese	8,881	0.054	99.693
43	Pears	8,201	0.050	99.743
44	Peaches, dried	7,597	0.046	99.789
45	Canned pork	5,800	0.035	99.824
46	Mutton	5,667	0.034	99.858
47	Onions	5,456	0.033	99.891
48	Cocoa and chocolate, manufactured	5,264	0.032	99.923
49	Fresh pork	3,270	0.020	99.943
50	Pickled fish	2,994	0.018	99 961
51	Honey	2,508	0.015	99.976
52	Rye flour	1,906	0 012	99.988
53	Fresh fish	1,731	0.010	99.998
54	Molasses and syrup	385	0 002	100 000
	Total	16,559,532	100 000	

TABLE 51—*Continued*

Order No.	Commodity	Annual average during war years: Total (millions of calories)	Per cent. of total calories	Cumulated per cent.
1	Wheat (nutrients in flour)	11,112,466	40.002	40.002
2	Wheat flour	5,527,236	19.897	59.899
3	Refined sugar	1,903,768	6.853	66.752
4	Lard	1,852,757	6.669	73.421
5	Bacon	1,637,090	5.893	79.314
6	Cottonseed oil	873,503	3.144	82.458
7	Hams and shoulders	488,675	1.759	84.217
8	Rice	464,813	1.673	85.890
9	Oleo oil	323,769	1.165	87.055
10	Milk, condensed and evaporated	290,367	1.045	88.100
11	Cornmeal and corn flour	280,054	1.008	89.108
12	Oatmeal and rolled oats	272,386	0.981	90.089
13	Lard compounds	262,828	0.946	91.035
14	Fresh beef	236,578	0.852	91.887
15	Glucose	207,488	0.747	92.634
16	Beans and dried peas	199,917	0.720	93.354
17	Syrup	187,293	0.674	94.028
18	Pickled pork	186,821	0.673	94.701
19	Canned beef	108,344	0.390	95.091
20	Cheese	104,799	0.377	95.468
21	Rye flour	89,287	0.321	95.789
22	Neutral lard	86,779	0.312	96.101
23	Pickled beef	86,587	0.312	96.413
24	Canned salmon	80,472	0.290	96.703
25	Raisins, dried	75,199	0.271	96.974
26	Potatoes	69,113	0.249	97.223
27	Butter	67,182	0.242	97.465
28	Tallow	59,875	0.216	97.681
29	Prunes, dried	57,730	0.208	97.889
30	Grape sugar	56,206	0.202	98.091
31	Stearin from animal fats	50,423	0.182	98.273
32	Apples, green and ripe	49,899	0.180	98.453
33	Fresh pork	44,048	0.159	98.612
34	Cocoa and chocolate, manufactured	41,852	0.151	98.763
35	Molasses	40,693	0.146	98.909
36	Corn oil	38,639	0.139	99.048
37	Bread and biscuit	34,530	0.124	99.172
38	Peanuts	25,094	0.090	99.262
39	Apples, dried	24,280	0.087	99.349
40	Sausage	23,947	0.086	99.435
41	Eggs	22,054	0.079	99.514
42	Apricots, dried	20,228	0.073	99.587
43	Oleomargarine	20,034	0.072	99.659
44	Cured fish	19,951	0.072	99.731
45	Oranges	17,208	0.062	99.793
46	Peaches, dried	13,627	0.049	99.842
47	Honey	9,848	0.035	99.877
48	Canned pork	8,403	0.030	99.907
49	Pears	8,283	0.030	99.937
50	Onions	7,244	0.026	99.963
51	Mutton	4,620	0.017	99.980
52	Fresh fish	2,718	0.010	99.990
53	Pickled fish	2,409	0.009	99.999
54	Molasses and syrup	392	0.001	100.000
	Total	27,779,806	100.000	

Wheat and wheat flour stand at the head here as would be expected, from data already presented. Together they account for about 80 per cent. of the protein exported in human foods. There are many notable changes in the position of commodities in the war years as compared with prewar. Thus fresh beef moved up from twentieth to fifth place in relative importance. Fresh pork moved up from thirty-fourth place to sixteenth. Rye flour advanced from thirty-seventh to nineteenth place. Condensed milk, as has been seen already, made a notable advance in its export significance, changing from fifteenth place to the eighth.

Before the war five commodities, wheat, wheat flour, hams and shoulders, bacon and rice accounted for more than 90 per cent. of the protein exported in human foods. During the war period rice has been dropped from this list, and four other commodities have come in, namely, fresh beef, beans and dried peas, oatmeal and rolled oats, and condensed and evaporated milk. So that, during the war period eight commodities contributed 90 per cent. of the total exported protein.

Lard stands at the top of the list in both periods, but it contributed 10 per cent. less to the total fat exports in the war period than before. One observes in the case of the fat the same thing which was apparent in protein exports, namely that in the war period there was an increased scattering of exports of nutrients among different commodities. Thus in the present case, while in the prewar period 9 commodities contributed over 90 per cent. of the total fat exported in human foods, in the war period 13 commodities were required to get over the 90 per cent. mark. In both periods only two primary products were included in this 90 per cent. group, namely cottonseed oil and wheat (including flour in the war period). The most notable single commodity advance in percentage contribution to fat exports during the war is perhaps that of bacon, though it involves only a slight change in position in the table. But bacon which contributed 8 per cent. of the total exported fat in prewar times contributed 22 per cent. during the war period.

Of the total exported carbohydrate four or five commodities, wheat, flour, rice and syrup or refined sugar and glucose account for over 90 per cent. In the prewar period syrup was one of the five commodities necessary to make up 90 per cent., but was replaced during the war period by refined sugar. Also glucose came in the list before the war. Condensed milk moved up from nine-

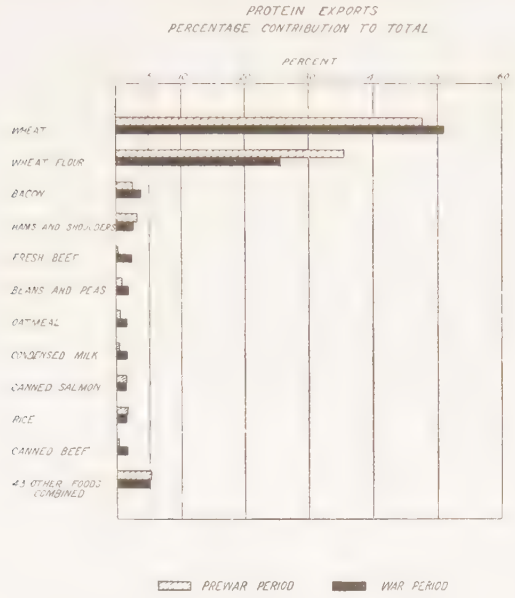

FIG. 21.—Diagram showing the relative importance of different commodities in the gross exports of protein in human foods.

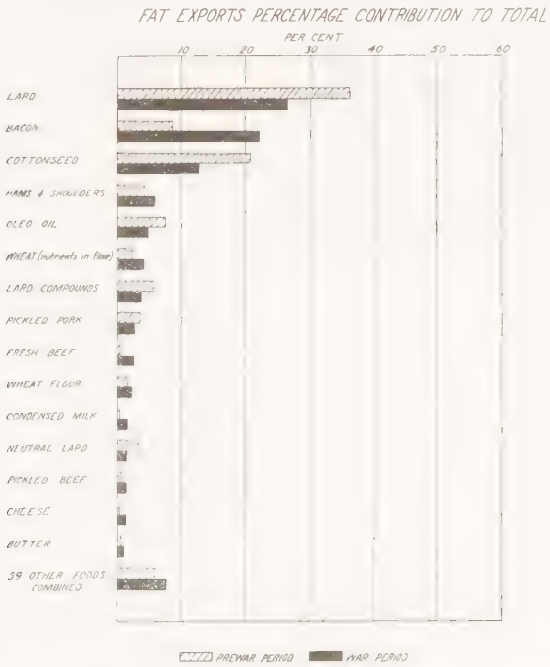

FIG. 22.—Diagram showing the relative importance of different commodities in the gross exports of fat in human foods.

teenth to ninth place, because of the tremendously increased exports and its high sugar content.

Table 51 well shows the readjustment and changes in human food exports brought about by the war. In both prewar and war periods 12 commodities contributed over 90 per cent. of the total caloric value of the exports. But only 8 out of the 12 commodities

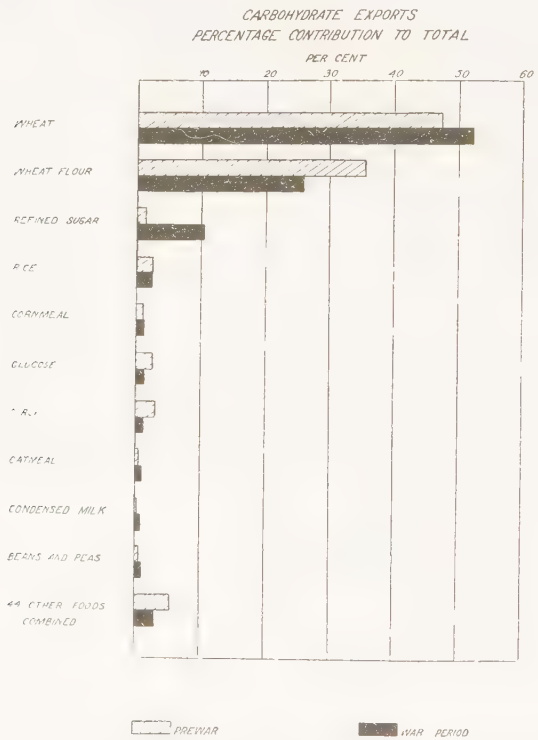

FIG. 23.—Diagram showing the relative importance of different commodities in the gross exports of carbohydrate in human foods.

on the prewar 90 per cent. list appear in the war period 90 per cent. list. And only 7 out of the 12 commodities on the war 90 per cent. list appear in the prewar. Refined sugar advanced during the war period to third place in caloric contribution to the exports, whereas formerly it had been in the fourteenth place in the commodity list. Cornmeal and oatmeal, as well as, of course, condensed milk, became more important factors in the nutrient exports during the war. Fresh beef came forward from forty-first

position to fourteenth. But even then fresh beef contributed less than 1 per cent. to the total caloric value of the exported human foods. In general, foods of relatively high nutrient concentration moved up in the list during the war and those of relatively low nutrient concentration went down. This is, of course, an expected consequence of the shortage of tonnage.

FIG. 24.—Diagram showing the relative importance of different commodities in their contribution to the caloric content of exported human foods.

As a whole these tables bear out the point made when the similar production tables were under discussion, namely that the contribution of a relatively few food commodities to the total is so tremendous that a whole flock of really minor, though usually considered important, staple foods might be totally neglected without making any special difference in the net nutritional result. This fact is so evident that in the days of Paley it might well have been adduced as a special instance of the goodness of God to food administrators as a class.

The data of Tables 48 to 51 are shown graphically in Figs. 21 to 24.

It is evident from these diagrams that, in our exports of human food, wheat, wheat flour, lard, bacon, cottonseed oil, hams and shoulders, and refined sugar are the only items of special significance in a nutritional sense. All but a relatively small percentage of the total nutritional value of the human food exports is comprised in these commodities.

Before leaving the subject of exports, and concluding this chapter, it is necessary to recall to mind that the data regarding what are technically called "foreign exports," which are the re-exports of imported foods of foreign origin have not been presented. The amounts involved are not generally large, but in arriving at a final net export balance accurately it is essential to include these re-exports of imported articles. It does not seem necessary, however, to present the detailed figures here. In arriving at net exports and imports, given in the next chapter, the "foreign export" figures were used in attaining the final result.

CHAPTER VIII

NET IMPORTS AND NET EXPORTS OF PRIMARY AND SECONDARY HUMAN FOODS

It is now possible, by combining the data discussed in Chapters VI and VII to arrive at net figures on imports and exports. The first step in this process is to make net foreign import tables, which can be done by combining Tables 28 and 32 in Chapter VI, which exhibit the gross importation of primary and secondary human foods, with the tables prepared in connection with, but omitted from Chapter VII, which exhibit the re-exportation of these same imported foods. The balance, shown in Tables 53 and 55, gives the amount of imported foods remaining in this country for consumption therein.

In Chapter VI it was pointed out that in making the nutrient calculations on imports no deductions for loss, spoilage, etc., were there made, it being the intention to make such allowances on the final net import tables. This is done in Tables 53 and 55. In arriving at the amounts to be deducted it has been necessary simply to make the best percentage estimate possible, there being no exact statistics on the matter. Some of these estimates are certainly rough, but it must be remembered that because of the slight importance of imports in the total nutritional intake of this country, with the exception of sugar and rice, an estimate of a deduction for industrial use or spoilage may be very far out of the way without having any significance in the final consumption result. The United States is, in this regard, in a very different position from a nation dependent upon imports for the major portion of its food. Anyone who is critically interested may calculate for himself the effect of doubling or halving the percentage deductions of imports listed in Table 52 upon the final per capita consumption figures of Chapter IX. He will find that only an insignificant and inappreciable effect is produced.

TABLE 52.—PERCENTAGE DEDUCTIONS FROM NET FOREIGN IMPORTS FOR NON-FOOD USES, SPOILAGE, WASTE IN STORING, HANDLING, TRANSPORTATION, ETC.

Commodity	Percentage deduction	Remarks
Rice flour	50 per cent.	This item includes rice flour, meal and broken rice. None of the meal goes to human food. It is estimated to average half the total item. The broken rice used in brewing has been all allowed for in production figures, though some of the imports are so used. Here all the broken rice is therefore allowed to go in as human food.
Wheat	5 per cent.	For loss in storage and transportation. Some of the imports are used for seed, but all the nutrients in the seed used have been allowed for in production and so no deduction is made for this item here.
Onions	10 per cent.	For spoilage in storage and distribution.
Potatoes	10 per cent.	For spoilage in storage and distribution.
Molasses	60 per cent.	It appears that at least this proportion of imported molasses goes to other than human food uses.
Bananas	10 per cent.	For spoilage in distribution.
Oranges	5 per cent.	For spoilage in distribution.
Cocoanut oil	100 per cent. 1911–12	For non-food industrial uses on the assumption that the distribution of the imported oil between food and non-food uses is the same as that of the domestically produced oil.
	100 per cent. 1912–13	
	99.5 per cent. 1913–14	
	97.5 per cent. 1914–15	
	98 per cent. 1915–16	
	99 per cent. 1916–17	
	87 per cent. 1917–18	
Cottonseed oil	5 per cent. 1911–12	Cf. preceding item.
	6 per cent. 1912–13	
	6 per cent. 1913–14	
	5 per cent. 1914–15	
	9 per cent. 1915–16	
	7 per cent. 1916–17	
	5 per cent. 1917–18	
Cacao, crude	25 per cent. of fat content, 18 per cent. of calories.	To allow for cocoa butter not used as food.

In Table 52 are listed the items on which deductions have been made, showing the amount in each case. These amounts are stated in percentages and are to be understood as percentages of the net imports deducted. For example, suppose in a particular year x bushels of wheat were imported and y bushels were re-exported. Then $(x - y)$ is the net import. According to Table 52 the deduction on wheat is 5 per cent. Then the final figure which appears in Table 53 for net wheat imports is $(x - y) - 0.05\ (x - y)$. The same rule is applied in all the other cases. In the case of items not mentioned in Table 52, no deductions have been made.

The same percentage deductions are applied to each of the seven years, except in the case of cottonseed and cocoanut oils. Undoubtedly the true losses and industrial uses vary somewhat from year to year, but it is assumed that these variations are likely to be as often in excess as in defect of the percentages here used. In the case of the oils more definite figures can be arrived at, and hence are used.

The net primary food imports consumed in the country are shown in Table 53.

TABLE 53.—SHOWING NET FOREIGN IMPORTS OF PRIMARY FOODS CONSUMED IN THE UNITED STATES, AFTER DEDUCTING RE-EXPORTS, NON-FOOD USES AND LOSSES

Commodity	1911-12				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	49,072	5,986	491	36,412	178,504
Rice	22,319	1,786	45	17,631	80,249
Rice flour	26,437	2,115	53*	20,885	95,061
Wheat	69,764	5,774	506	38,037	184,368
Wheat flour	14,108	1,608	142	10,595	51,353
Sub-total—Grains	181,700	17,269	1,237	123,560	589,535
Vegetables					
Beans and lentils	26,553	5,869	381	16,347	94,638
Onions	33,203	457	98	2,903	14,685
Peas, dried	17,446	4,291	175	10,816	63,653
Potatoes	331,158	5,962	331	48,679	227,137
Sub-total—Vegetables	408,360	16,579	985	78,745	400,113
Saccharine Materials					
Honey	490	2	.....	397	1,642
Molasses	82,819	.....	.....	53,832	220,744
Beet sugar	2,950	.....	.....	2,950	12,098
Cane sugar	2,542,958	.....	.....	2,542,958	10,427,585
Maple sugar and syrup	982	.....	.....	756	3,105
Sub-total—Sugars	2,630,199	2	.....	2,600,893	10,665,174
Fruits					
Bananas	946,985	7,575	3,788	121,214	563,684
Currants	14,652	352	263	10,872	48,291
Dates	9,940	179	259	7,018	31,775
Figs	8,360	351	17	6,203	27,185
Raisins	1,250	28	37	857	3,983
Olives	18,391	145	3,715	1,562	41,562
Oranges	157	1	.....	12	53
Sub-total—Fruits	999,735	8,631	8,079	147,738	716,533
Vegetable Oils and Nuts					
Almonds	7,638	1,451	3,805	1,193	46,210
Filberts	4,907	424	1,795	355	19,867
Peanuts	6,848	1,405	2,382	1,033	32,118
Walnuts	16,435	1,577	5,580	1,115	62,887
Cocoanuts, shredded	2,418	150	1,388	764	16,657
Cream and Brazil nuts	9,520	818	3,217	323	34,735
Chinese nut oil	16,652	.....	16,319	.....	151,819
Edible olive oil	16,861	.....	16,513	.....	153,730
Cocoanut oil	.....	.....	.....	.....	.....
Cottonseed oil	618	.....	606	.....	5,643
Cacao, crude	57,337	8,295	19,432	16,208	279,750
Cocoa and chocolate, manufactured	1,273	219	493	433	7,266
Sub-total—Oils and Nuts	140,507	14,339	71,530	21,424	810,682
Fish					
Cured fish	57,300	9,741	3,094	.....	68,720
Fresh fish	11,370	1,956	432	.....	12,458
Crab meat	1,130	178	18	6	922
Lobsters	4,000	424	30	14	2,065
Sub-total—Fish	73,800	12,299	3,574	20	84,165
Grand Total—All Primary Food Imports	4,434,301	69,119	85,405	2,972,380	13,266,202

TABLE 53—*Continued*

Commodity	1912-13				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	48,283	5,891	483	35,827	175,636
Rice	25,197	2,016	50	19,906	90,601
Rice flour	31,203	2,496	63	24,650	112,197
Wheat	18,598	1,540	136	10,140	49,151
Wheat flour	9,476	1,080	94	7,117	34,494
Sub-total—Grains	132,757	13,023	826	97,640	462,079
Vegetables					
Beans and lentils	27,407	6,057	393	16,873	97,682
Onions	18,257	250	53	1,596	8,075
Peas, dried	20,407	5,020	203	12,653	74,459
Potatoes	8,217	148	8	1,208	5,639
Sub-total—Vegetables	74,288	11,475	657	32,330	185,855
Saccharine Materials					
Honey	871	4	.....	708	2,918
Molasses	97,226	.....	.....	63,196	259,141
Beet sugar	82,845	.....	.....	82,845	339,713
Cane sugar	2,701,014	.....	.....	2,701,014	11,075,708
Maple sugar and syrup	982	.....	.....	756	3,105
Sub-total—Sugars	2,882,938	4	.....	2,848,519	11,680,585
Fruits					
Bananas	902,417	7,219	3,609	115,509	537,156
Currants	13,855	333	250	10,280	45,661
Dates	13,643	245	355	9,632	43,610
Figs	7,404	311	15	5,493	24,074
Raisins	1,115	24	33	765	3,554
Olives	14,308	113	2,890	1,215	32,335
Oranges	335	2	1	26	113
Sub-total—Fruits	953,077	8,247	7,153	142,920	686,503
Vegetable Oils and Nuts					
Almonds	6,985	1,362	3,572	1,119	43,374
Filberts	4,526	408	1,720	341	19,046
Peanuts	8,521	1,857	3,154	1,365	42,513
Walnuts	11,857	1,207	4,269	853	48,118
Cocoanuts, shredded	2,995	186	1,719	946	20,632
Cream and Brazil nuts	5,313	456	1,796	181	19,387
Chinese nut oil	20,945	.....	20,525	.....	190,958
Edible olive oil	18,212	.....	17,849	.....	166,051
Cocoanut oil					
Cottonseed oil	1,414	.....	1,386	.....	[illegible]
Cacao, crude	54,042	7,819	18,315	15,277	[illegible]
Cocoa and chocolate, manufactured	1,574	270	611	535	[illegible]
Sub-total—Oils and Nuts	136,384	13,565	74,916	20,617	[illegible]
Fish					
Cured fish	58,037	9,866	3,134	.....	69,604
Fresh fish	12,449	2,141	473	.....	13,641
Crab meat	1,265	200	21	7	1,031
Lobsters	3,633	374	27	13	1,827
Sub-total—Fish	75,384	12,581	3,655	20	86,103
Grand Total—All Primary Food Imports	4,254,828	58,895	87,207	3,142,046	13,936,761

TABLE 53.—*Continued*

Commodity	1913–14 Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	57,189	6,977	572	42,434	208,028
Rice	52,428	4,195	105	41,417	188,517
Rice flour	31,723	2,538	63	25,061	114,067
Wheat	31,864	2,637	231	17,374	84,212
Wheat flour	7,872	897	79	5,911	28,652
Sub-total—Grains	181,076	17,244	1,050	132,197	623,476
Vegetables					
Beans and lentils	43,791	9,677	628	26,960	156,075
Onions	25,883	355	77	2,263	11,449
Peas, dried	17,214	4,235	172	10,673	62,809
Potatoes	88,587	1,595	88	13,023	60,761
Sub-total—Vegetables	175,475	15,862	965	52,919	291,094
Saccharine Materials					
Honey	1,197	5	.....	973	4,013
Molasses	141,824	.....	.....	92,185	378,011
Beet sugar	745	.....	.....	745	3,056
Cane sugar	2,867,316	.....	.....	2,867,316	11,757,646
Maple sugar and syrup	982	.....	.....	756	3,105
Sub-total—Sugars	3,012,064	5	.....	2,961,975	12,145,831
Fruits					
Bananas	1,027,878	8,222	4,111	131,567	611,836
Currants	14,349	344	258	10,646	47,292
Dates	13,686	247	356	9,662	43,749
Figs	8,472	355	16	6,286	27,548
Raisins	2,023	44	61	1,387	6,444
Olives	19,387	153	3,916	1,647	43,813
Oranges	135	1	.....	10	46
Sub-total—Fruits	1,085,930	9,366	8,718	161,205	780,728
Vegetable Oils and Nuts					
Almonds	8,524	1,550	4,066	1,274	49,359
Filberts	5,624	477	2,019	399	22,347
Peanuts	19,845	4,636	7,887	3,411	106,318
Walnuts	16,702	1,339	4,763	948	53,619
Cocoanuts, shredded	4,656	288	2,672	1,471	32,076
Cream and Brazil nuts	8,838	760	2,988	301	32,247
Chinese nut oil	17,228	.....	16,883	.....	157,069
Edible olive oil	21,685	.....	21,251	.....	197,706
Cocoanut oil	168	.....	164	.....	1,528
Cottonseed oil	7,341	.....	7,195	.....	66,941
Cacao, crude	69,973	10,124	23,713	19,781	341,405
Cocoa and chocolate, manufactured	1,392	239	540	473	7,948
Sub-total—Oils and Nuts	181,976	19,413	94,141	28,058	1,068,563
Fish					
Cured fish	76,898	13,073	4,153	.....	92,224
Fresh fish	16,470	2,833	626	.....	18,046
Crab meat	1,187	188	19	7	969
Lobsters	3,504	336	25	11	1,651
Sub-total—Fish	98,059	16,430	4,823	18	112,890
Grand Total—All Primary Food Imports	4,734,580	78,320	109,697	3,336,372	15,022,582

TABLE 53—*Continued*

Commodity	1914–15				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	25,592	3,123	256	18,989	93,097
Rice	50,680	4,054	101	40,037	182,229
Rice flour	16,965	1,357	34	13,403	61,003
Wheat	6,345	525	46	3,460	16,767
Wheat flour	5,572	634	56	4,184	20,280
Sub-total—Grains	105,154	9,693	493	80,073	373,376
Vegetables					
Beans and lentils	21,319	4,711	305	13,126	75,984
Onions	19,147	264	58	1,673	8,468
Peas, dried	8,918	2,193	89	5,529	32,538
Potatoes	6,592	118	6	969	4,522
Sub-total—Vegetables	55,976	7,286	458	21,297	121,512
Saccharine Materials					
Honey	1,551	6	.....	1,260	5,198
Molasses	187,684	.....	.....	121,994	500,244
Beet sugar	387	.....	.....	387	1,586
Cane sugar	3,060,785	.....	.....	3,060,785	12,550,976
Maple sugar and syrup	668	.....	.....	514	2,115
Sub-total—Sugars	3,251,075	6	.....	3,184,940	13,060,119
Fruits					
Bananas	861,752	6,914	3,447	110,304	512,951
Currants	13,602	326	245	10,092	44,829
Dates	9,921	179	258	7,004	31,713
Figs	8,647	363	17	6,416	28,116
Raisins	1,172	26	35	804	3,733
Olives	13,150	104	2,656	1,116	29,717
Oranges	72	.....	.....	5	25
Sub-total—Fruits	908,316	7,912	6,658	135,741	651,084
Vegetable Oils and Nuts					
Almonds	7,585	1,393	3,654	1,146	44,375
Filberts	6,041	519	2,198	434	24,320
Peanuts	10,431	2,283	3,880	1,680	52,287
Walnuts	14,931	1,398	4,954	990	55,814
Cocoanut, shredded	2,613	162	1,500	826	18,001
Cream and Brazil nuts	6,915	595	2,338	235	25,232
Chinese nut oil	17,255	.....	16,910	.....	157,320
Edible olive oil	23,412	.....	22,944	.....	213,462
Cocoanut oil	711	.....	697	.....	6,485
Cottonseed oil	6,508	.....	6,377	.....	59,341
Cacao, crude	66,566	9,631	22,559	18,817	324,777
Cocoa and chocolate, manufactured	1,072	185	416	365	6,120
Sub-total—Oils and Nuts	164,040	16,166	88,427	24,493	987,534
Fish					
Cured fish	70,325	11,956	3,798	.....	84,341
Fresh fish	21,128	3,634	803	.....	23,149
Crab meat	1,041	165	16	6	849
Lobsters	4,008	366	28	13	1,807
Sub-total—Fish	96,502	16,121	4,645	19	110,146
Grand Total—All Primary Food Imports	4,581,063	57,184	100,681	3,446,563	15,303,771

TABLE 53—*Continued*

Commodity	1915–16 Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	9,781	1,193	98	7,258	35,578
Rice	48,775	3,902	98	38,532	175,379
Rice flour	12,613	1,009	25	9,965	45,353
Wheat	132,574	10,973	963	72,284	350,363
Wheat flour	28,426	3,241	284	21,347	103,472
Sub-total—Grains	232,169	20,318	1,468	149,386	710,145
Vegetables					
Beans and lentils	13,099	2,895	188	8,064	46,686
Onions	18,728	257	55	1,637	8,283
Peas, dried	13,498	3,321	135	8,369	49,247
Potatoes	5,074	91	5	745	3,479
Sub-total—Vegetables	50,399	6,564	383	18,815	107,695
Saccharine Materials					
Honey	1,905	7	.....	1,547	6,384
Molasses	220,288	.....	.....	143,186	587,146
Beet sugar	.....	.....	.....	.....	.....
Cane sugar	3,198,613	.....	.....	3,198,613	13,116,151
Maple sugar and syrup	856	.....	.....	659	2,708
Sub-total—Sugars	3,421,662	7	.....	3,344,005	13,712,389
Fruits					
Bananas	771,223	6,169	3,085	98,717	459,065
Currants	10,948	263	197	8,123	36,084
Dates	12,527	226	325	8,845	40,045
Figs	3,065	128	6	2,275	9,967
Raisins	334	7	10	228	1,062
Olives	21,667	171	4,376	1,840	48,964
Oranges	128	1	.....	9	44
Sub-total—Fruits	819,892	6,965	7,999	120,037	595,231
Vegetable Oils and Nuts					
Almonds	7,247	1,411	3,701	1,160	44,946
Filberts	4,663	383	1,627	321	17,999
Peanuts	12,174	2,898	4,930	2,133	66,473
Walnuts	16,332	1,632	5,774	1,154	65,081
Cocoanut, shredded	3,794	235	2,178	1,199	26,137
Cream and Brazil nuts	6,380	548	2,157	218	23,278
Chinese nut oil	17,353	.....	17,005	.....	158,209
Edible olive oil	25,104	.....	24,602	.....	228,883
Cocoanut oil	594	.....	582	.....	5,414
Cottonseed oil	7,092	.....	6,950	.....	64,664
Cacao, crude	86,299	12,486	29,246	24,396	421,059
Cocoa and chocolate, manufactured	1,015	174	394	345	5,795
Sub-total—Oils and Nuts	188,647	19,767	99,146	30,926	1,127,938
Fish					
Cured fish	66,643	11,329	3,599	.....	79,925
Fresh fish	24,631	4,236	936	.....	26,988
Crab meat	1,338	212	22	8	1,092
Lobsters	3,976	349	27	12	1,725
Sub-total—Fish	96,588	16,126	4,584	20	109,730
Grand Total—All Primary Food Imports	4,808,757	69,747	113,580	3,663,189	16,363,128

TABLE 53—*Continued*

Commodity	1916–17				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	1,551	189	15	1,150	5,642
Rice	48,373	3,869	97	38,214	173,935
Rice flour	8,549	684	17	6,753	30,739
Wheat	622,717	51,540	4,525	339,525	1,645,695
Wheat flour	15,329	1,748	153	11,513	55,799
Sub-total—Grains	696,519	58,030	4,807	397,155	1,911,810
Vegetables					
Beans and lentils	88,144	19,480	1,263	54,266	314,152
Onions	40,741	560	120	3,562	18,021
Peas, dried	19,738	4,855	198	12,237	72,016
Potatoes	74,641	1,344	74	10,973	51,195
Sub-total—Vegetables	223,264	26,239	1,655	81,038	455,384
Saccharine Materials					
Honey	2,145	8	.....	1,742	7,187
Molasses	279,297	.....	.....	181,542	744,427
Beet sugar	13	.....	.....	13	54
Cane sugar	3,148,579	.....	.....	3,148,579	12,910,984
Maple sugar and syrup	1,420	.....	.....	1,093	4,491
Sub-total—Sugars	3,431,454	8	.....	3,332,969	13,667,143
Fruits					
Bananas	722,327	5,778	2,889	92,457	429,960
Currants	4,620	111	83	3,428	15,229
Dates	11,376	205	295	8,031	36,367
Figs	7,217	303	13	5,355	23,469
Raisins	835	18	25	573	2,662
Olives	20,605	163	4,162	1,750	46,564
Oranges	154	1	.....	12	52
Sub-total—Fruits	767,134	6,579	7,467	111,606	554,303
Vegetable Oils and Nuts					
Almonds	10,431	1,985	5,207	1,632	63,209
Filberts	5,872	511	2,156	426	23,868
Peanuts	15,716	3,836	6,536	2,824	88,086
Walnuts	17,402	1,634	5,790	1,156	65,251
Cocoanut, shredded	4,402	273	2,527	1,391	30,329
Cream and Brazil nuts	6,488	558	2,193	221	23,673
Chinese nut oil	23,974	.....	23,494	.....	218,581
Edible olive oil	26,144	.....	25,621	.....	238,364
Cocoanut oil	355	.....	348	.....	3,234
Cottonseed oil	5,781	.....	5,666	.....	52,709
Cacao, crude	133,634	19,335	45,289	37,777	652,013
Cocoa and chocolate, manufactured	826	141	321	281	4,718
Sub-total—Oils and Nuts	251,025	28,273	125,148	45,708	1,464,035
Fish					
Cured fish	73,100	12,426	3,947	.....	87,669
Fresh fish	27,126	4,668	1,030	.....	29,721
Crab meat	1,804	285	29	11	1,471
Lobsters	3,583	357	26	12	1,748
Sub-total—Fish	105,613	17,736	5,032	23	120,609
Grand Total—All Primary Food Imports	5,475,009	136,865	144,109	3,968,499	18,173,284

TABLE 53—*Continued*

Commodity	1917–18 Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Derivative Products					
Macaroni	291	35	3	216	1,059
Rice	134,457	10,755	268	106,221	483,468
Rice flour	10,899	873	22	8,611	39,189
Wheat	700,763	57,957	5,088	381,792	1,850,566
Wheat flour	52,951	6,036	530	39,767	192,743
Sub-total—Grains	899,361	75,656	5,911	536,607	2,567,025
Vegetables					
Beans and lentils	92,646	20,474	1,329	57,040	330,200
Onions	30,493	419	90	2,666	13,487
Peas, dried	31,711	7,801	316	19,661	115,702
Potatoes	27,308	491	27	4,014	18,730
Sub-total—Vegetables	182,158	29,185	1,762	83,381	478,119
Saccharine Materials					
Honey	3,299	14	.....	2,678	11,053
Molasses	319,082	.....	.....	207,402	850,470
Beet sugar	.....	.....	.....	.....	.....
Cane sugar	2,801,476	.....	.....	2,801,476	11,487,660
Maple sugar and syrup	2,495	.....	.....	1,921	7,895
Sub-total—Sugars	3,126,352	14	.....	3,013,477	12,357,078
Fruits					
Bananas	721,320	5,771	2,885	92,328	429,360
Currants	2,332	56	43	1,730	7,685
Dates	2,450	44	63	1,729	7,831
Figs	4,612	194	9	3,422	14,997
Raisins	361	8	11	247	1,150
Olives	7,830	62	1,582	665	17,695
Oranges	47	.....	.....	4	15
Sub-total—Fruits	738,952	6,135	4,593	100,125	478,733
Vegetable Oils and Nuts					
Almonds	10,528	2,039	5,343	1,673	64,891
Filberts	9,178	802	3,385	669	37,462
Peanuts	34,532	8,823	15,043	6,496	202,744
Walnuts	10,326	1,164	4,107	823	46,309
Cocoanut, shredded	9,250	574	5,309	2,923	63,724
Cream and Brazil nuts	13,455	1,158	4,548	457	49,093
Chinese nut oil	16,820	.....	16,484	.....	153,352
Edible olive oil	8,666	.....	8,492	.....	79,012
Cocoanut oil	15,200	.....	14,896	.....	138,594
Cottonseed oil	6,050	.....	5,928	.....	55,157
Cacao, crude	157,463	22,783	53,363	44,514	768,269
Cocoa and chocolate, manufactured	117	20	46	40	670
Sub-total—Oils and Nuts	291,585	37,363	136,944	57,595	1,659,277
Fish					
Cured fish	78,140	13,284	4,220	.....	93,714
Fresh fish	27,177	4,674	1,033	.....	29,777
Crab meat	2,203	348	35	14	1,796
Lobsters	3,172	317	23	11	1,552
Sub-total—Fish	110,692	18,623	5,311	25	126,839
Grand Total—All Primary Food Imports	5,349,100	166,976	154,521	3,791,210	17,667,071

Table 53 is summarized by years in Table 54.

TABLE 54.—SUMMARY OF IMPORTED PRIMARY FOOD CONSUMED IN THE UNITED STATES

(Metric Tons)

Year	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
1911–12	4,434,301	69,119	85,405	2,972,380	13,266,202
1912–13	4,254,828	58,895	87,207	3,142,046	13,936,761
1913–14	4,734,580	78,320	109,697	3,336,372	15,022,582
1914–15	4,580,963	56,984	100,681	3,446,653	15,303,771
1915–16	4,808,763	69,747	113,580	3,663,195	16,363,152
1916–17	5,475,009	136,865	144,009	3,968,499	18,173,284
1917–18	5,349,100	166,976	154,521	3,791,210	17,667,171
Total, 7 years	33,637,544	636,906	795,100	24,320,355	109,732,923
Annual average, whole period	4,805,363	90,987	113,586	3,474,336	15,676,132
Annual average, 3 prewar years	4,474,570	68,778	94,103	3,150,266	14,075,182
Annual average, war period	5,053,459	107,643	128,198	3,717,389	16,876,845
Per cent. nutrients to total (and calories per lb.), 3 prewar years		1.5	2.1	70.4	1426.8
Per cent. nutrients to total (and calories per lb.), war period		2.1	2.5	73.6	1514.9
Per cent. nutrients to total (and calories per lb.), whole period		1.9	2.4	72.3	1479.7

From this table it is evident that in general the amount of imported primary foods consumed in the United States has increased steadily since 1911–12. The energy content has gone up every year except the last. There are some fluctuations in the protein and fat curves but the general upward trend is unmistakable in all. In all cases the annual average for the war period is higher than in the prewar years.

The secondary food imports consumed in this country are exhibited in Table 55.

TABLE 55.—SHOWING NET FOREIGN IMPORTS OF SECONDARY FOODS CONSUMED IN THE UNITED STATES, AFTER DEDUCTING RE-EXPORTS

Commodity	1911–12				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	907	138	140	...	1,870
Mutton and lamb	340	44	82	...	941
Fresh pork	227	30	55	...	635
Bacon and hams	...	...	...	...	...
Bologna sausage	440	80	87	...	1,135
Oleo stearin	2,229	.....	2,229	...	20,733
Sub-total—Meats	4,143	292	2,593	...	25,314
Poultry and Eggs					
Eggs, whole	662	86	62	...	927
Eggs, dried, frozen, etc.	20	3	2	...	32
Sub-total—Poultry	682	89	64	...	959
Dairy Products					
Butter	447	5	380	...	3,553
Cheese	21,063	5,435	7,120	506	90,552
Cream	4,371	107	786	191	8,524
Milk	1,363	52	49	63	925
Sub-total—Dairy Products	27,244	5,599	8,335	760	103,554
Grand Total	32,069	5,980	10,992	760	129,827

TABLE 55—*Continued*

Commodity	1912–13				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	6,804	1,034	1,048	...	14,025
Mutton and lamb	907	118	218	...	2,510
Fresh pork	454	61	110	...	1,270
Bacon and hams	...	...	...	...	...
Bologna sausage	327	59	64	...	844
Oleo stearin	4,315	.....	4,315	...	40,137
Sub-total—Meats	12,807	1,272	5,755	...	58,786
Poultry and Eggs					
Eggs, whole	930	122	87	...	1,303
Eggs, dried, frozen, etc.	104	15	11	...	164
Sub-total—Poultry	1,034	137	98	...	1,467
Dairy Products					
Butter	525	5	447	...	4,178
Cheese	22,356	5,768	7,556	537	96,107
Cream	4,865	119	875	212	9,488
Milk	2,937	111	105	131	1,973
Sub-total—Dairy Products	30,683	6,003	8,983	880	111,746
Grand Total	44,524	7,412	14,836	880	171,999

TABLE 55—*Continued*

Commodity	1913–14				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	81,656	12,411	12,576	.....	168,317
Mutton and lamb	5,766	749	1,383	.....	15,952
Fresh pork	2,098	281	508	.....	5,873
Bacon and hams	911	104	421	.....	4,349
Bologna sausage	326	59	64	.....	842
Oleo stearin	2,379	.....	2,379	....	22,128
Sub-total—Meats	93,136	13,604	17,331	.....	217,461
Poultry and Eggs					
Eggs, whole	4,082	533	381	.....	5,717
Eggs, dried, frozen, etc	1,551	230	164	.....	2,463
Sub-total—Poultry	5,633	763	545	.....	8,180
Dairy Products					
Butter	3,533	35	3,004	.....	28,083
Cheese	28,863	7,446	9,757	692	124,082
Cream	6,917	169	1,244	302	13,490
Milk	23,586	891	845	1,062	15,861
Sub-total—Dairy Products	62,899	8,541	14,850	2,056	181,516
Grand Total	161,668	22,908	32,726	2,056	407,157

TABLE 55—*Continued*

Commodity	1914–15				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	83,297	12,661	12,827	.....	171,700
Mutton and lamb	7,044	915	1,690	.....	19,489
Fresh pork	7,371	988	1,783	.....	20,638
Bacon and hams	3,421	390	1,580	.....	16,329
Bologna sausage	94	17	19	.....	243
Oleo stearin	1,100	.....	1,100	.....	10,229
Sub-total—Meats	102,327	14,971	18,999	.....	238,628
Poultry and Eggs					
Eggs, whole	2,040	267	190	.....	2,856
Eggs, dried, frozen, etc	3,888	575	412	.....	6,172
Sub-total—Poultry	5,928	842	602	.....	9,028
Dairy Products					
Butter	1,669	16	1,419	.....	13,265
Cheese	22,609	5,833	7,642	543	97,195
Cream	8,104	198	1,457	355	15,805
Milk	51,721	1,828	1,730	1,667	30,391
Sub-total—Dairy Products	84,103	7,875	12,248	2,565	156,656
Grand Total	192,358	23,688	31,849	2,565	404,312

TABLE 55—*Continued*

Commodity	1915–16				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	20,406	3,101	3,143	...	42,062
Mutton and lamb	8,572	1,115	2,057	...	23,716
Fresh pork	895	119	217	...	2,507
Bacon and hams	303	34	140	...	1,443
Bologna sausage	19	4	4	...	50
Oleo stearin	413	.....	413	...	3,842
Sub-total—Meats	30,608	4,373	5,974	...	73,620
Poultry and Eggs					
Eggs, whole	498	65	46	...	698
Eggs, dried, frozen, etc.	2,731	405	289	...	4,336
Sub-total—Poultry	3,229	470	335	...	5,034
Dairy Products					
Butter	313	4	267	...	2,493
Cheese	13,527	3,490	4,572	324	58,151
Cream	4,657	113	837	203	9,082
Milk	28,944	883	833	206	12,193
Sub-total—Dairy Products	47,441	4,490	6,509	733	81,919
Grand Total	81,278	9,333	12,818	733	160,573

TABLE 55—*Continued*

Commodity	1916–17				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	4,734	720	729	...	9,759
Mutton and lamb	2,035	264	488	...	5,630
Fresh pork	749	101	181	...	2,097
Bacon and hams	85	10	39	...	406
Bologna sausage	...	...	...	...	...
Oleo stearin	505	.....	505	...	4,698
Sub-total—Meats	8,108	1,095	1,942	...	22,590
Poultry and Eggs					
Eggs, whole	754	99	71	...	1,057
Eggs, dried, frozen, etc.	4,680	693	496	...	7,429
Sub-total—Poultry	5,434	792	567	...	8,486
Dairy Products					
Butter	236	3	201	...	1,878
Cheese	6,492	1,675	2,194	156	27,908
Cream	2,902	71	522	127	5,659
Milk	34,250	1,046	987	253	14,486
Sub-total—Dairy Products	43,880	2,795	3,904	536	49,931
Grand Total	57,422	4,682	6,413	536	81,007

TABLE 55—*Continued*

Commodity	1917–18				
	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Meats and Derivative Products					
Beef and veal	9,383	1,426	1,445	.....	19,341
Mutton and lamb	911	118	219	.....	2,520
Fresh pork	838	112	203	.....	2,347
Bacon and hams	118	14	54	.....	563
Bologna sausage	7	1	1	.....	17
Oleo stearin	2,983	.....	2,983	.....	27,748
Sub-total—Meats	14,240	1,671	4,905	.....	52,536
Poultry and Eggs					
Eggs, whole	1,093	142	102	.....	1,531
Eggs, dried, frozen, etc	6,654	984	705	.....	10,561
Sub-total—Poultry	7,747	1,126	807	.....	12,092
Dairy Products					
Butter	893	9	759	.....	7,095
Cheese	4,408	1,137	1,490	106	18,949
Cream	323	68	499	122	5,413
Milk	61,143	2,303	2,181	2,707	40,817
Sub-total—Dairy Products	66,767	3,517	4,929	2,935	72,274
Grand Total	88,754	6,314	10,641	2,935	136,902

Table 55 is summarized by years in Table 56.

TABLE 56.—SUMMARY OF IMPORTED SECONDARY FOOD CONSUMED IN THE UNITED STATES

(Metric Tons)

Year	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
1911–12	32,069	5,980	10,992	760	129,827
1912–13	44,524	7,412	14,836	880	171,999
1913–14	161,668	22,908	32,726	2,056	407,157
1914–15	192,358	23,688	31,849	2,565	404,312
1915–16	81,278	9,333	12,818	733	160,573
1916–17	57,422	4,682	6,413	536	81,007
1917–18	88,754	6,314	10,641	2,935	136,902
Total, 7 years	658,073	80,317	120,275	10,465	1,491,777
Annual average, whole period	94,010	11,474	17,182	1,495	213,111
Annual average, 3 prewar years	79,420	12,100	19,518	1,232	236,328
Annual average, war period	104,953	11,004	15,130	1,692	195,699
Per cent. nutrients to total (and calories per lb.), 3 prewar years	.....	15.2	24.6	1.6	1349.8
Per cent. nutrients to total (and calories per lb.), war period	.....	10.5	14.7	1.6	845.8
Per cent. nutrients to total (and calories per lb.), whole period	.....	12.2	18.3	1.6	1028.3

The same regular course of net imports consumed here is not observed in the case of secondary foods as was with the primary (cf. Table 54). The high points for net secondary food imports were in 1913–14 and 1914–15. The annual average net import rate was lower in the war period than prewar for protein, fat and calories. Further, the nutrient concentration of the net secondary food imports fell off greatly, on the average, in the war period. This is in marked contrast to the net primary food imports, where the concentration of nutrients on the average increased in the war period.

Tables 54 and 56 are combined in Table 57, which shows the net imports by years of all human foods.

TABLE 57.—SUMMARY OF IMPORTED HUMAN FOOD CONSUMED IN THE UNITED STATES

(Metric Tons)

Years	Net imports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
1911–12	4,466,370	75,099	96,397	2,973,140	13,396,029
1912–13	4,299,352	66,307	102,043	3,142,926	14,108,760
1913–14	4,896,248	101,228	142,423	3,338,428	15,429,739
1914–15	4,773,321	80,672	132,530	3,449,218	15,708,083
1915–16	4,890,041	79,080	126,398	3,663,928	16,523,725
1916–17	5,532,431	141,547	150,422	3,969,035	18,254,291
1917–18	5,437,854	173,290	165,162	3,794,145	17,804,073
Total, 7 years	34,295,617	717,223	915,375	24,330,820	111,224,700
Annual average, whole period	4,899,374	102,460	130,768	3,475,831	15,889,243
Annual average, 3 prewar years	4,553,990	80,878	113,621	3,151,498	14,311,509
Annual average, war period	5,158,412	118,647	143,628	3,719,081	17,072,543
Per cent. nutrients to total (and calories per lb.), 3 prewar years		1.8	2.5	69.2	1425.5
Per cent. nutrients to total (and calories per lb.), war period		2.3	2.8	72.1	1520.2
Per cent. nutrients to total (and calories per lb.), whole period		2.1	2.7	70.9	1471.1

The data of Table 57 are shown graphically in Fig. 25. It is clear that the general tendency has been toward the consumption of more and more imported foods in this country during the period under investigation, but the course of events has not been entirely regular. This is shown in Fig. 25.

The preponderant effect of sugar in the net imports of food is clear. The carbohydrate line is the dominant one. About 70 per cent. of the weight of all the food brought into the United States for consumption is carbohydrate. Protein and fat form a very small part of the imported food.

The way is now cleared for the final net export and import table,

which is the last step necessary for the calculation of consumption. Table 58 gives the net balance sheet of the external movement of foodstuffs to and from this country. The figures in this table are the result of taking for each commodity the difference between the total gross exports, and the imports for consumption, and calling the balance minus when more goes out of the country than comes in, and plus when the case is the other way about. In other words,

FIG. 25.—Showing the course of net foreign imports of human foods (consumed in the United States) since 1911. Solid line denotes total net food imports; dash line, protein content; dot line, fat content; dash-dot line, carbohydrate content.

Table 58 gives the balances resulting from algebraically adding the total gross exports (−) of Tables 40 and 43 and the residual imports for consumption (+) of Tables 53 and 55. If the residual imports are larger than the gross exports the balance will be plus, and will be marked + in Table 58. If, on the other hand, the gross exports are larger than the residual imports the item will be marked minus. To get consumption it is necessary then only to add or subtract, according to the sign of the item, the figures of Table 58 to the corresponding production figures.

TABLE 58.—FINAL NET BALANCE OF EXPORTS (−) AND IMPORTS (+) OF HUMAN FOODSTUFFS FROM 1911 TO 1918

Commodity	1911–12				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−1,719,183	−171,976	− 15,828	−1,136,111	−5,511,287
Corn products	− 42,846	− 3,213	− 1,799	− 28,231	− 145,677
Rye products	− 383	− 27	− 4	− 301	− 1,376
Rice and products	− 24,633	− 1,970	− 48	− 19,457	− 88,577
Other cereals	− 4,438	− 718	− 319	− 2,991	− 18,199
Sub-total—Grains	−1,791,483	−177,904	− 17,998	−1,187,091	−5,765,116
Vegetables					
Legumes	+ 29,311	+ 6,972	+ 350	+ 17,983	+ 105,665
Potatoes	+ 289,301	+ 5,209	+ 290	+ 42,526	+ 198,428
Other vegetables	+ 23,970	+ 328	+ 71	+ 2,084	+ 10,528
Sub-total—Vegetables	+ 342,582	+ 12,509	+ 711	+ 62,593	+ 314,621
Sugars	+2,357,695	.....	.....	+2,371,208	+9,723,297
Fruits					
Apples	− 120,845	− 678	− 824	− 26,536	− 119,252
Oranges	− 37,852	− 151	− 38	− 2,915	− 12,767
Bananas	+ 946,985	+ 7,575	+ 3,788	+ 121,214	+ 563,684
Other fruits	− 11,323	− 192	+ 3,882	− 7,357	+ 5,286
Sub-total—Fruits	+ 776,965	+ 6,554	+ 6,808	+ 84,406	+ 436,951
Vegetable Oils and Nuts					
Nuts	+ 45,080	+ 5,304	+ 17,275	+ 4,396	+ 200,455
Vegetable oils	− 158,111	.....	−154,957	.....	−1,441,705
Chocolate and cocoa	+ 57,438	+ 8,312	+ 19,470	+ 16,242	+ 280,323
Sub-total—Oils and Nuts	− 55,593	+ 13,616	−118,212	+ 20,638	− 960,927
Fish	+ 39,313	+ 6,096	+ 1,313	+ 20	+ 37,759
Sub-total—All Primary	+1,669,479	−139,129	−127,378	+1,351,774	+3,786,585
Meats and Meat Products					
Beef and products	− 86,378	− 4,272	− 66,322	.....	− 634,755
Pork and products	− 528,339	− 24,071	−414,966	.....	−3,960,794
Mutton and products	− 19,186	− 168	− 18,204	.....	− 170,056
Other meat products	− 2,024	− 650	− 85	− 19	− 3,528
Sub-total—Meats	− 635,927	− 29,161	−499,577	− 19	−4,769,133
Poultry and eggs	− 9,927	− 1,298	− 926	.....	− 13,901
Oleomargarine	− 1,660	− 20	− 1,378	.....	− 12,907
Dairy products	+ 8,870	+ 3,616	+ 3,352	− 3,127	+ 33,102
Sub-total—All Secondary	− 638,644	− 26,863	−498,529	− 3,146	−4,762,839
Grand Total	+1,030,835	−165,992	−625,907	+1,348,628	− 976,254

TABLE 58—*Continued*

Commodity	1912–13				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−3,484,431	−319,388	− 28,695	−2,107,158	−10,217,174
Corn products	− 42,715	− 3,203	− 1,794	− 28,144	− 145,230
Rye products	− 471	− 32	− 5	− 370	− 1,692
Rice and products	− 15,079	− 1,206	− 29	− 11,907	− 54,220
Other cereals	− 22,097	− 3,579	− 1,591	− 14,894	− 90,610
Sub-total—Grains	−3,564,793	−327,408	− 32,114	−2,162,473	−10,508,926
Vegetables					
Legumes	+ 30,843	+ 7,394	+ 359	+ 18,920	+ 111,334
Potatoes	− 57,559	− 1,035	− 58	− 8,462	− 39,476
Other vegetables	+ 2,131	+ 24	+ 5	+ 161	+ 814
Sub-total—Vegetables	− 24,585	+ 6,383	+ 306	+ 10,619	+ 72,672
Sugars	+2,675,975	+ 1	.....	+2,669,672	+10,947,178
Fruits					
Apples	− 161,142	− 729	− 842	− 27,851	− 125,136
Oranges	− 33,498	− 133	− 33	− 2,580	− 11,299
Bananas	+ 902,417	+ 7,219	+ 3,609	+ 115,509	+ 537,156
Other fruits	− 48,087	− 1,155	+ 2,913	− 28,121	− 92,825
Sub-total—Fruits	+ 659,690	+ 5,202	+ 5,647	+ 56,957	+ 307,896
Vegetable Oils and Nuts					
Nuts	+ 36,885	+ 4,834	+ 15,130	+ 4,328	+ 178,248
Vegetable oils	− 111,572	.....	−109,339	.....	− 1,617,374
Chocolate and cocoa	+ 54,972	+ 7,978	+ 18,676	+ 15,593	+ 268,987
Sub-total—Oils and Nuts	− 19,715	+ 12,812	− 75,533	+ 19,921	− 570,139
Fish	+ 28,537	+ 4,164	+ 614	+ 20	+ 23,385
Sub-total—All Primary	− 244,891	−298,846	−101,080	+ 594,716	+ 272,066
Meat and Meat Products					
Beef and products	− 53,991	− 1,707	− 46,959	.....	− 443,974
Pork and products	− 496,398	− 20,689	−393,535	.....	− 3,747,396
Mutton and products	− 15,356	− 192	− 14,229	.....	− 133,173
Other meat products	− 995	− 806	+ 1,449	− 22	+ 10,104
Sub-total—Meats	− 560,740	− 23,394	−453,274	− 22	− 4,314,439
Poultry and eggs	− 13,021	− 1,699	− 1,214	.....	− 18,220
Oleomargerine	− 1,369	− 16	− 1,137	.....	− 10,637
Dairy products	+ 17,311	+ 4,700	+ 5,810	− 2,334	+ 63,678
Sub-total—All Secondary	− 557,819	− 20,409	−449,815	− 2,356	− 4,279,618
Grand Total	− 802,710	−319,255	−550,895	+ 592,360	− 4,007,552

TABLE 58—*Continued*

Commodity	1913–14				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−3,522,457	−323,384	− 29,039	−2,134,015	−10,346,857
Corn products	− 33,107	− 2,483	− 1,390	− 21,814	− 112,560
Rye products	− 737	− 50	− 6	− 580	− 2,649
Rice and products	+ 10,173	+ 815	+ 20	+ 8,041	+ 36,582
Other cereals	− 7,351	− 1,191	− 530	− 4,955	− 30,143
Sub-total—Grains	−3,553,479	−326,293	− 30,945	−2,153,323	−10,455,627
Vegetables					
Legumes	+ 47,435	+ 10,968	+ 610	+ 29,152	+ 170,263
Potatoes	+ 29,024	+ 523	+ 28	+ 4,267	+ 19,907
Other vegetables	+ 14,890	+ 201	+ 44	+ 1,284	+ 6,500
Sub-total—Vegetables	+ 91,349	+ 11,692	+ 682	+ 34,703	+ 196,670
Sugars	+2,820,735	+ 1	.....	+2,794,689	+11,459,830
Fruits					
Apples	− 114,950	− 543	− 634	− 20,849	− 93,681
Oranges	− 49,091	− 196	− 49	− 3,780	− 16,558
Bananas	+1,027,878	+ 8,222	+ 4,111	+ 131,567	+ 611,836
Other fruits	− 14,493	− 196	+ 4,201	− 4,255	+ 21,165
Sub-total—Fruits	+ 849,344	+ 7,287	+ 7,629	+ 102,683	+ 522,762
Vegetable Oils and Nuts					
Nuts	+ 60,535	+ 8,341	+ 23,182	+ 7,278	+ 279,615
Vegetable oils	− 49,523	.....	− 48,534	.....	− 451,611
Chocolate and cocoa	+ 70,416	+ 10,200	+ 23,885	+ 19,931	+ 343,932
Sub-total—Oils and Nuts	+ 81,428	+ 18,541	− 1,467	+ 27,209	+ 171,936
Fish	+ 36,834	+ 5,256	+ 700	+ 18	+ 28,848
Sub-total—All Primary	+ 326,211	−283,516	− 23,401	+ 805,979	+ 1,924,419
Meats and Meat Products					
Beef and products	+ 22,435	+ 10,342	− 36,427	.....	− 296,158
Pork and products	− 456,723	− 20,245	−361,818	.....	− 3,450,468
Mutton and products	− 3,532	+ 472	− 6,300	.....	− 56,658
Other meat products	− 1,443	− 563	+ 309	− 14	+ 512
Sub-total—Meats	− 439,263	− 9,994	−404,236	− 14	− 3,802,772
Poultry and eggs	− 5,504	− 692	− 494	.....	− 7,418
Oleomargarine	− 1,159	− 14	− 961	.....	− 9,003
Dairy products	+ 49,828	+ 7,298	+ 11,746	− 1,114	+ 134,507
Sub-total—All Secondary	− 396,098	− 3,402	−393,945	− 1,128	− 3,684,686
Grand Total	− 69,887	−286,918	−417,346	+ 804,851	− 1,760,267

TABLE 58—*Continued*

Commodity	1914–15				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−8,518,765	−750,253	− 66,490	−1,944,118	−23,968,848
Corn products	− 48,796	− 3,659	− 2,049	− 32,152	− 165,911
Rye products	− 7,140	− 485	− 64	− 5,619	− 25,659
Rice and products	− 24,767	− 1,982	− 49	− 19,561	− 89,057
Other cereals	− 31,119	− 5,040	− 2,241	− 20,974	− 127,606
Sub-total—Grains	−8,630,587	−761,419	− 70,893	−5,022,424	−24,377,081
Vegetables					
Legumes	− 8,548	− 1,512	− 149	− 5,586	− 30,442
Potatoes	− 88,995	− 1,603	− 89	− 13,082	− 61,039
Other vegetables	− 1,186	− 21	− 3	− 137	− 687
Sub-total—Vegetables	− 98,729	− 3,136	− 241	− 18,805	− 92,168
Sugars	+2,854,477	+ 1	.....	+2,809,840	+11,521,956
Fruits					
Apples	− 174,558	− 775	− 890	− 29,555	− 132,789
Oranges	− 55,814	− 223	− 56	− 4,299	− 18,825
Bananas	+ 861,752	+ 6,914	+ 3,447	+ 110,304	+ 512,951
Other fruits	− 18,262	− 488	+ 2,631	− 7,412	− 7,677
Sub-total—Fruits	+ 613,118	+ 5,428	+ 5,132	+ 69,038	+ 353,660
Vegetable Oils and Nuts					
Nuts	+ 45,851	+ 5,833	+ 17,639	+ 4,927	+ 208,103
Vegetable oils	− 104,734	.....	−102,641	.....	− 955,024
Chocolate and cocoa	+ 64,027	+ 9,195	+ 21,574	+ 17,954	+ 310,281
Sub-total—Oils and Nuts	+ 5,144	+ 15,028	− 63,428	+ 22,881	− 436,640
Fish	+ 40,744	+ 5,944	+ 869	+ 19	+ 33,428
Sub-total—All Primary	−5,215,833	−738,454	−128,561	−2,139,451	−12,996,845
Meat and Meat Products					
Beef and products	− 79,217	− 9,676	− 47,714	.....	− 484,191
Pork and products	− 537,174	− 28,263	− 407,118	.....	− 3,905,371
Mutton and products	− 3,896	+ 686	− 7,913	.....	− 70,790
Other meat products	− 7,410	− 707	− 5,127	− 17	− 50,668
Sub-total—Meats	− 627,697	− 37,960	−467,872	− 17	− 4,511,020
Poultry and eggs	− 8,370	− 1,026	− 733	.....	− 10,998
Oleomargarine	− 2,382	− 29	− 1,978	.....	− 18,513
Dairy products	+ 34,264	− 523	− 2,296	− 4,374	− 41,555
Sub-total—All Secondary	− 604,185	− 39,538	−472,879	− 4,391	− 4,582,086
Grand Total	−5,820,018	−777,692	− 601,440	−2,143,842	−17,578,931

TABLE 58 —*Continued*

Commodity	1915–16				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−5,978,619	−538,176	− 47,885	−3,546,069	−17,193,294
Corn products	− 45,405	− 3,404	− 1,906	− 29,917	− 154,378
Rye products	− 10,635	− 723	− 96	− 8,370	− 38,216
Rice and products	− 58,388	− 4,671	− 116	− 46,121	− 209,947
Other cereals	− 24,947	− 4,041	− 1,796	− 16,814	− 102,298
Sub-total—Grains	−6,117,994	−551,015	− 51,799	−3,647,291	−17,698,133
Vegetables					
Legumes	− 27,827	− 5,593	− 438	− 17,581	− 99,059
Potatoes	− 117,526	− 2,117	− 118	− 17,277	− 80,611
Other vegetables	+ 2,231	+ 27	+ 5	+ 168	+ 856
Sub-total—Vegetables	− 143,122	− 7,683	− 551	− 34,690	− 178,814
Sugars	+2,513,937	+ 1	.....	+2,464,110	+10,104,269
Fruits					
Apples	− 104,987	− 411	− 454	− 15,415	− 69,248
Oranges	− 50,023	− 199	− 51	− 3,852	− 16,872
Bananas	+ 771,223	+ 6,169	+ 3,085	+ 98,717	+ 459,065
Other fruits	− 40,110	− 1,269	+ 3,674	− 30,344	− 95,486
Sub-total—Fruits	+ 576,103	+ 4,290	+ 6,254	+ 49,106	+ 277,459
Vegetable Oils and Nuts					
Nuts	+ 46,658	+ 6,344	+ 19,061	+ 5,619	+ 226,315
Vegetable oils	74,891	....	− 73,397	..	682,947
Chocolate and cocoa	+ 82,782	+ 11,880	+ 27,881	+ 23,200	+ 400,975
Sub-total—Oils and Nuts	+ 54,546	+ 18,224	− 26,455	+ 28,819	− 55,657
Fish	+ 4,955	− 884	− 1,818	+ 20	− 19,345
Sub-total—All Primary	−3,111,575	−537,067	− 74,369	−1,139,926	− 7,570,221
Meats and Meat Products					
Beef and products	− 171,936	− 20,916	− 70,838	.....	− 745,739
Pork and products	− 699,864	− 48,751	−471,969	.....	− 4,593,797
Mutton and products	− 1,336	+ 788	− 5,936	.....	− 51,993
Other meat products	− 12,956	− 1,499	− 7,751	− 32	− 78,388
Sub-total—Meats	− 886,092	− 70,378	−556,494	− 32	− 5,469,917
Poultry and eggs	− 14,986	− 1,910	− 1,365	.....	− 20,480
Oleomargarine	− 2,461	− 30	− 2,043	.....	− 19,127
Dairy products	− 55,136	− 7,825	− 12,935	− 24,207	− 251,878
Sub-total—All Secondary	− 958,675	− 80,143	−572,837	− 24,239	− 5,761,402
Grand Total	−4,070,250	−617,210	−647,206	−1,164,165	−13,331,623

TABLE 58—*Continued*

Commodity	1916–17				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−4,554,443	−411,010	− 36,745	−2 707,844	−13,131,004
Corn products	− 52,146	− 3,910	− 2,190	− 34,359	− 177,300
Rye products	− 6,571	− 447	− 59	− 5,172	− 23,614
Rice and products	− 98,213	− 7,857	− 196	− 77,584	− 353,144
Other cereals	− 50,975	− 8,172	− 3,632	− 34,000	− 206,853
Sub-total—Grains	−4,762,348	−431,396	− 42,822	−2,858,959	−13,891,915
Vegetables					
Legumes	+ 42,656	+ 10,181	+ 547	+ 25,736	+ 152,469
Potatoes	− 3,380	− 60	− 4	− 495	− 2,318
Other vegetables	+ 29,368	+ 401	+ 86	+ 2,550	+ 12,901
Sub-total—Vegetables	+ 68,644	+ 10,522	+ 629	+ 27,791	+ 163,052
Sugars	+2,689,922	+ 1	.....	+2,618,740	+10,738,332
Fruits					
Apples	− 120,375	− 423	− 452	− 15,646	− 70,282
Oranges	− 58,595	− 235	− 59	− 4,511	− 19,764
Bananas	+ 722,327	+ 5,778	+ 2,889	+ 92,457	+ 429,960
Other fruits	− 36,544	− 697	+ 3,695	− 21,669	− 56,960
Sub-total—Fruits	+ 506,813	+ 4,423	+ 6,073	+ 50,631	+ 282,954
Vegetable Oils and Nuts					
Nuts	+ 50,144	+ 6,825	+ 21,034	+ 6,186	+ 248,917
Vegetable oils	19,884		19,486		181,359
Chocolate and cocoa	+ 129,098	+ 18,554	+ 43,530	+ 36,235	+ 626,117
Sub-total—Oils and Nuts	+ 159,358	+ 25,379	+ 45,078	+ 42,421	+ 693,675
Fish	+ 27,258	+ 3,423	− 281	+ 23	+ 12,674
Sub-total—All Primary	−1,310,353	−387,648	+ 8,677	− 119,353	− 2,001,228
Meats and Meat Products					
Beef and products	− 172,691	− 23,965	− 59,773	.....	− 655,468
Pork and products	− 717,351	− 49,883	−486,293	.....	− 4,731,865
Mutton and products	− 6,314	+ 75	− 6,758	.....	− 62,566
Other meat products	− 13,142	− 1,591	− 7,717	− 36	− 78,808
Sub-total—Meats	− 909,498	− 75,364	−560,541	− 36	− 5,528,707
Poultry and eggs	− 11,783	− 1,458	− 1,040	.....	− 15,629
Oleomargarine	− 2,563	− 31	− 2,127	.....	− 19,920
Dairy products	− 120,284	− 16 306	− 28,130	− 39,500	− 490,828
Sub-total—All Secondary	−1,044,128	− 93,159	−591,838	− 39,536	− 6,055,084
Grand Total	−2,354,481	−480,807	−583,161	− 158,889	− 8,056,312

TABLE 58—*Continued*

Commodity	1917–18				
	Net exports in metric tons	Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
Grains and Their Products					
Wheat and products	−2,254,702	−251,361	− 22,710	−1,656,035	− 8,032,723
Corn products	− 183,096	− 13,733	− 7,691	− 120,659	− 622,626
Rye products	− 75,040	− 5,103	− 675	− 59,056	− 269,657
Rice and products	− 4,398	− 353	− 9	− 3,468	− 15,811
Other cereals	− 159,196	− 25,790	− 11,461	− 107,298	− 652,788
Sub-total—Grains	−2,676,432	−296,340	− 42,546	−1,946,516	− 9,593,605
Vegetables					
Legumes	+ 59,474	+ 14,115	+ 697	+ 36,445	+ 213,889
Potatoes	− 79,544	− 1,433	− 80	− 11,693	− 54,558
Other vegetables	+ 14,335	+ 192	+ 41	+ 1,228	+ 6,212
Sub-total—Vegetables	− 5,735	+ 12,874	+ 658	+ 25,980	+ 165,543
Sugars	+2,728,426	− 15	.....	+2,636,091	+10,809,417
Fruits					
Apples	− 44,235	− 149	− 156	− 5,430	− 24,395
Oranges	− 39,233	− 157	− 39	− 3,021	− 13,234
Bananas	+ 721,320	+ 5,771	+ 2,885	+ 92,328	+ 429,360
Other fruits	− 43,497	− 769	+ 842	− 23,712	− 92,265
Sub-total—Fruits	+ 594,355	+ 4,696	+ 3,532	+ 60,165	+ 299,466
Vegetable Oils and Nuts					
Nuts	+ 81,604	+ 13,461	+ 35,854	+ 12,225	+ 438,872
Vegetable oils	+ 392	.....	+ 384	.....	+ 3,544
Chocolate and cocoa	+ 141,766	+ 20,083	+ 47,273	+ 39,177	+ 678,641
Sub-total—Oils and Nuts	+ 223,762	+ 33,544	+ 83,511	+ 51,402	+ 1,121,057
Fish	+ 30,919	+ 4,169	+ 3	+ 25	+ 18,368
Sub-total—All Primary	+ 895,295	−241,072	+ 45,158	+ 827,147	+ 2,820,246
Meats and Meat Products					
Beef and products	− 297,528	− 47,305	− 74,786	− 276	− 892,850
Pork and products	− 805,095	− 64,353	−507,806	.....	− 4,992,237
Mutton and products	− 2,316	− 6	− 2,284	.....	− 21,277
Other meat products	− 9,078	− 1,523	− 3,915	− 34	− 42,790
Sub-total—Meats	−1,114,017	−113,187	−588,791	− 310	− 5,949,154
Poultry and eggs	− 5,504	− 605	− 430	.....	− 6,468
Oleomargarine	− 2,905	− 35	− 2,411	.....	− 22,577
Dairy products	− 206,102	− 24,310	− 31,063	− 76,837	− 704,355
Sub-total—All Secondary	−1,328,528	−138,137	−622,695	− 77,147	− 6,682,554
Grand Total	− 433,233	−379,209	−577,537	+ 750,000	− 3,862,308

Table 58 includes both primary and secondary foods. Certain special items, such as flour, bread and biscuit, macaroni, etc., which have up to this point been handled separately in the import and export statistics, are here combined, in the interest of simplicity, and referred to the basic raw material, in this case wheat. This combination simplifies the table and at the same time leads up to a more accurate determination of consumption than would be possible if the attempt were made to handle the special items separately.

This table furnishes a great deal of information not hitherto available in readily comprehensible form. We commonly think of this country as a food exporting nation, but the matter when analyzed is not to be covered by any such simple offhand statement. There are very complex interrelationships of human food materials in their export and import movements.

In order to gain a comprehensive idea of the matter it will be well to start with a yearly summary of Table 58. This is given in Table 59.

TABLE 59.—SUMMARY OF NET IMPORTS AND EXPORTS OF HUMAN FOOD
(Metric Tons)

Years	Net exports (commodity)	Protein	Fat	Carbohydrate	Calories (millions)
1911–12	+ 1,030,835	− 165,992	− 625,907	+1,348,628	− 976,254
1912–13	− 802,710	− 319,255	− 550,895	+ 592,360	− 4,007,552
1913–14	− 69,887	− 286,918	− 417,346	+ 804,851	− 1,760,267
1914–15	− 5,820,018	− 777,692	− 601,440	−2,143,842	−17,578,931
1915–16	− 4,070,250	− 617,210	− 647,206	−1,164,165	−13,331,623
1916–17	− 2,354,481	− 480,807	− 583,161	− 158,889	− 8,056,312
1917–18	− 433,233	− 379,209	− 577,537	+ 750,000	− 3,862,308
Totals, whole period	−12,519,744	−3,027,083	−4,003,492	+ 28,943	−49,573,247
Annual average, whole period	− 1,788,535	− 432,440	− 571,927	+ 4,135	− 7,081,892
Annual average, 3 prewar years	+ 52,746	− 257,388	− 531,383	+ 915,280	− 2,248,024
Annual average war period	− 3,169,495	− 563,729	− 602,336	− 679,224	−10,707,293

The data of Table 59 are shown graphically in Figs. 26 and 27. Figure 26 gives the net exports of human food commodities as such while Fig. 27 gives the nutrients.

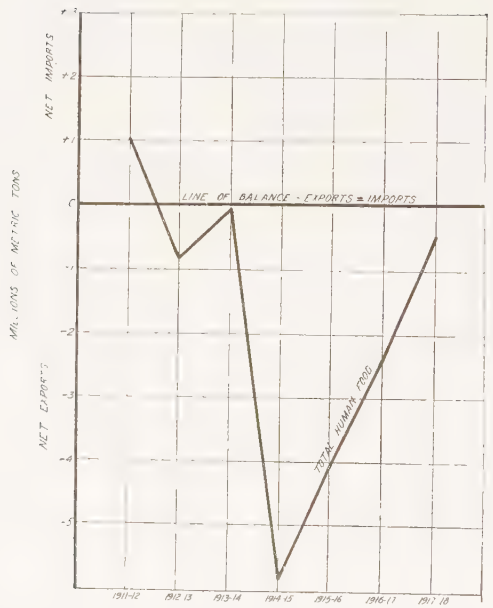

FIG. 26.—Showing the net exports and imports of all human food commodities from 1911 to 1918.

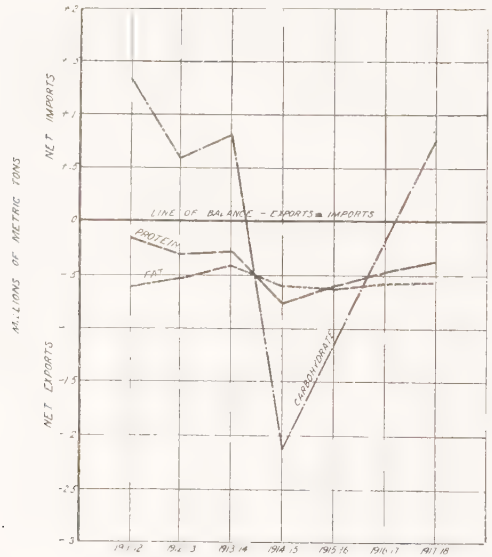

FIG. 27.—Showing the protein (dash line), fat (dot line), and carbohydrate (dash-dot line) content of the net exports and imports of human foods in the United States, 1911 to 1918.

Taking all human foods together in this way, it appears that in 1911–12 we imported a greater total tonnage of food commodities than we exported. Each year since the export tonnage has been greater than the import, but in 1913–14 the departure from the line of balance was only very slight. In the first year of the war, 1914–15, the net export of human foods was over 5,000,000 metric tons—a stupendous amount. After that year the net export fell off rapidly year by year until in 1917–18 the net export line was nearly back to the zero balance line, and almost in the position that it was in the prewar period.

During the whole period this nation has had a net export balance of protein and fat in human foods. And, as Fig. 27 shows, the war has not greatly changed the horizontal course of the lines for these two nutrients. The case is very different with carbohydrate. The United States had a net import of carbohydrate before the war. Its enormous import of sugar was sufficient more than to offset all the carbohydrate in exported foods. With the outbreak of the war, however, and the enormous exports of breadstuffs and increased exports of sugar the carbohydrate balance swung very far down on the export side in 1914–15. Since then it has been swinging back again, until in 1917–18 the United States was once more in the prewar condition of having a net import of carbohydrate.

The story of the separate commodity groups is an interesting one. In the case of the grains used as human food and their derivative products we have had a net export balance throughout the period investigated. The only point of note is its amount, which increased enormously in the early years of the war.

The vegetables in general showed a net import balance in the prewar years. The scale turned the other way to a small export balance during the first two years of the war, and then in 1916–17 swung back the other way to a net import balance which increased (so far as nutrients are concerned) in 1917–18.

The sugars are always a net import balance commodity group. The amount runs nearly level, speaking in a broad way, year after year.

Fruits show a net import balance every year. The net import of bananas far overtops the net exports of most of the other fruit items.

Oils and nuts form a heterogeneous group. Nuts exhibit, of course, a net import balance throughout. Vegetable oils show

a diminishing net export balance to 1917–18 when it turns to an import balance. It must be remembered always that we are now speaking only of commodities used as human food. The course of the vegetable oils is so interesting that it seems worth while to show it graphically, as is done in Fig. 28.

FIG. 28.—Net exports and imports of vegetable oils used as human food since 1911–12.

Chocolate and cocoa, of course, exhibit always an import balance.

Fish show a small net import balance throughout.

Turning to the secondary foods a more consistent condition of net exportation is encountered. In the meat products the balance is always in this export direction, increasing steadily in amount during the war period. The same is true of poultry and eggs and oleomargarine.

The dairy products have exhibited an extreme change in their import-export movement in the period here covered. Before the war we showed a small but growing import balance of these products. With the onset of the war the balance went the other way and we have a steadily increasing net export. The facts are shown graphic-

ally in Fig. 29. The calory content is the figure plotted in this case.

What this diagram means is that before the war we added to our national nutritional resources by importing increasing amounts of dairy products. Since the war we have subtracted from our

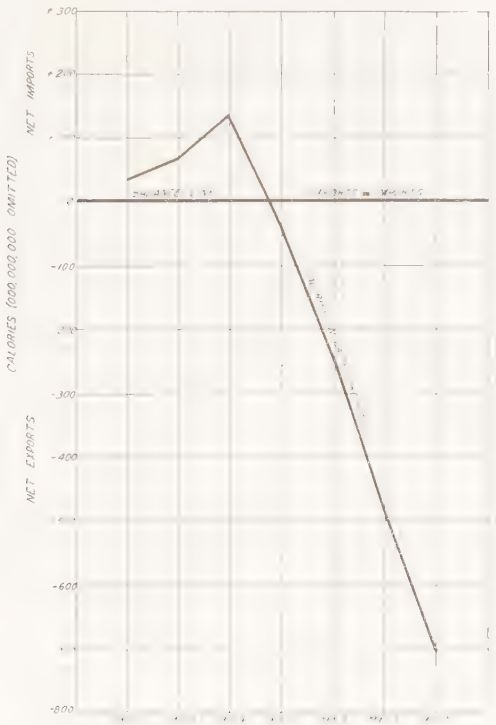

FIG. 29.—Net exports and imports of dairy products since 1911–12, expressed in items of calories.

human food resources in this country by sending out ever increasing amounts of milk and its products.

It is of interest to compare the totals of Table 59 with those of Table 14 (Chapter V) which gives the total production of human food in the United States. Taking the whole seven years investigated as a unit it is seen that the net amount of human food (as commodity) subtracted as net exports from our national food resources was, in round figures, 12.5 million metric tons. In

the same period we produced 630.4 million metric tons of human food. In other words, our *net* loss or outgo of human foods as exports *was rather less than 2 per cent. of our total production of the same foods.*

Owing to the relatively high nutrient concentration of exported foods, a slightly different result is obtained with the various nutrients. Taking protein first it is seen that the total production of protein in human foods was, in the whole seven years, 28.6 million metric tons. The net subtraction of this fundamental nutrient, in the form of human food, amounted in the same period to 3.0 million metric tons. The net loss by export thus was about 10.5 per cent. of the production.

In the case of fat the net exports over the whole seven year period are almost exactly 10 per cent. of the production. The carbohydrate situation is that if the period from July, 1911 to July, 1918 is taken as a unit, there was no loss by export, but the people of the country had all the carbohydrate they produced, which was in round figures 115 million metric tons in the form of human foods, *plus* 28,943 metric tons imported. It is, of course, the fact that this is a sugar-importing nation which brings about this quite unexpected result.

Taking energy content as indicative of general food value it is seen that the net loss in seven years from this country by exports of human food was 49.6 million million calories, while the production in the same period was 963.6 million millions. The net loss thus amounted to about 5 per cent. of the production.

CHAPTER IX

THE CONSUMPTION OF HUMAN FOOD IN THE UNITED STATES

We come now to the first goal to which the long and tedious calculations in the preceding chapters have been leading, namely the consumption of human foodstuffs in the United States. Hitherto there have been available only the roughest guesses as to the total domestic consumption of all but a few items of food, such as wheat and sugar. If anyone were confronted, as the Food Administration was almost daily from the time it started, with the naive and simple question, "How much corn, or oats, or molasses, or fish, or milk, or nuts"—or any one of a long series of other foods—"is consumed annually in the United States as human food?" no accurate answer could be given. Yet the question is obviously a fair one, and one which somebody in the nation ought to be able to answer with a considerable degree of accuracy. For some 20 odd great staple commodities or groups of like commodities it is now possible to present figures of a relatively high degree of accuracy as to consumption. On the basis of these figures it is possible to discuss effectively many interesting and important problems; such as, for example, that of the relative significance of great groups of staples, like the grains and the vegetables, in the nutrition of the people of the nation. We can calculate with accuracy the total national food bill, and so forth.

The statistical material in this book has been so developed to this point that in order to get the consumption figures it is only necessary to add or subtract, according to the sign, the figures of Table 58 in the last chapter from those of Tables 7 and 11 of Chap-

ters III and IV. These two tables, 7 and 11, it will be recalled, give the net production of human foods. Of course it is necessary to group and combine certain items of Tables 7 and 11 to conform to the rubrics of Table 58, but this is easily done.

The final net results as to consumption of human foods are set forth in Table 61. In that table the results are given for the several nutrient values, protein, fat, carbohydrate and calories, only. This is the most scientific, and as soon as one becomes accustomed to it, by far the most useful way of thinking about food consumption.

There are certain points regarding the makeup of Table 61 which need to be mentioned here. It will be recalled that in an earlier chapter it was stated (p. 32) that no account was taken of "carry-over" or crop-end reserves. This policy has been followed throughout, and for the reasons earlier stated is undoubtedly the most accurate method possible to follow. For practically all *human foods* either one or both of the following conditions obtain regarding carry-overs: Either there is absolutely no definite information in existence regarding the amount of such carry-over, or it is certain that the amount is negligibly small in comparison with the total consumption. The one outstanding exception is wheat and its products. There the annual reserve on July 1 is accurately known and the amount is often large enough to be significant. Consequently it has seemed advisable in the final consumption table to make allowance for the carry-over of this crop each year. The theory of the thing is clear. As shown in Table 60 the total reserves of wheat and flour in the country on July 1, 1911, were the equivalent of 97,995,000 bushels of wheat. On July 1, 1912, the reserves were 84,189,000 bushels of wheat. The reserves being *smaller* at the end of 1911–12 than at the beginning means that the difference was consumed in this country. Or, for the year 1911–12, there should be added to the consumption figures arrived at by subtracting *net* exports from production, 97,995,000 − 84,189,000 = 13,806,000 bushels. The same method has been followed for each year, except of course that when the reserves are larger at the end of the year than at the beginning the difference is subtracted from rather than added to the gross consumption.

The crop-end reserves of wheat and flour are shown in Table 60 for each year since 1900.

TABLE 60.—CROP-END RESERVES OF WHEAT AND FLOUR
(In Bushels)

On July 1 of year named	Total reserves	Farm reserves	Visible supply	Visible supply of flour as wheat	Wheat in other positions, estimated as 40 per cent. of visible wheat
1901	107,556,000	30,552,000	49,028,000	8,365,000	19,611,000
1902	110,125,000	52,437,000	35,783,000	7,592,000	14,313,000
1903	86,455,000	42,540,000	26,524,000	6,781,000	10,610,000
1904	81,055,000	36,634,000	26,329,000	7,560,000	10,532,000
1905	63,538,000	24,257,000	23,150,000	6,871,000	9,260,000
1906	108,340,000	46,053,000	39,776,000	6,601,000	15,910,000
1907	146,753,000	54,853,000	60,883,000	6,664,000	24,353,000
1908	72,425,000	33,797,000	23,256,000	6,070,000	9,302,000
1909	46,141,000	15,062,000	18,099,000	5,740,000	7,240,000
1910	79,814,000	35,680,000	25,417,000	8,550,000	10,167,000
1911	97,995,000	34,071,000	40,093,000	7,794,000	16,037,000
1912	84,189,000	23,876,000	36,999,000	8,514,000	14,800,000
1913	107,812,000	35,515,000	45,424,000	8,703,000	18,170,000
1914	81,006,000	32,236,000	28,646,000	8,666,000	11,458,000
1915	57,634,000	28,972,000	15,208,000	7,371,000	6,083,000
1916	179,174,000	74,731,000	66,560,000	11,259,000	26,624,000
1917	50,969,000	15,617,000	19,123,000	8,586,000	7,649,000
1918	17,504,000	8,283,000	3,713,000	4,023,000	1,485,000

One further point regarding wheat is to be noted. Since Chapter III was written a revision of the estimate of the 1917–18 wheat crop has been made. The final official estimate by the Food Administration[1] of that year's crop is 608,287,000 bushels, instead of the 620,000,000 bushels used in Chapter III. We have accordingly made this reduction in wheat figures for 1917–18 in Table 61.

[1] Cf. Official Statement of the U. S. Food Administration, Vol. I, No. 3, p. 14, August, 1918.

TABLE 61.—THE CONSUMPTION OF HUMAN FOODS IN THE UNITED STATES, 1911 TO 1918
(Metric Tons)

Reference No.	Commodity	1911–12			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	1,000,730	87,132	6,589,209	31,933,764
356	Corn products	205,809	99,607	1,831,949	9,283,484
357	Rye products	10,215	1,351	118,242	539,899
358	Rice and products	13,472	338	133,036	605,503
359	Other cereals	26,728	10,457	150,341	824,114
	Sub-total—Grains	1,256,954	198,885	8,822,777	43,186,764
	Vegetables				
360	Legumes	66,717	4,619	174,915	1,034,622
361	Potatoes	100,861	5,604	823,688	3,843,272
362	Other vegetables	28,662	9,607	282,235	1,367,003
	Sub-total Vegetables	196,240	19,830	1,280,838	6,244,897
363	Sugars	454	.....	3,906,511	16,021,424
	Fruits				
364	Apples	8,646	8,500	309,136	1,388,209
365	Oranges	1,571	392	30,223	132,398
366	Bananas	7,575	3,788	121,214	563,684
367	Other fruits	6,492	7,173	151,684	710,188
	Sub-total—Fruits	24,284	19,853	612,257	2,794,479
	Vegetable Oils and Nuts				
368	Nuts	40,460	77,555	30,491	1,012,435
369	Vegetable oils	.....	464,403	.....	4,321,063
370	Chocolate and cocoa	8,312	19,470	16,242	280,323
	Sub-total—Oils and Nuts	48,772	561,428	46,733	5,613,821
371	Fish	86,948	19,176	20	552,810
	Sub-total—All Primary	1,613,652	819,172	14,669,136	74,414,195
	Meats and Meat Products				
372	Beef and products	546,104	516,545	1,725	7,072,130
373	Pork and products	388,745	1,963,696	2,664	19,874,512
374	Mutton and products	45,782	61,465	521	762,158
	Sub-total—Meats	979,981	2,541,621	4,891	27,705,272
375	Poultry and eggs	235,699	165,906	.....	2,508,307
376	Oleomargarine	680	47,038	.....	440,412
377	Dairy products	726,604	1,368,995	880,525	19,337,072
	Sub-total—All Secondary	1,942,964	4,123,560	885,416	49,991,063
	Grand Total	3,556,616	4,942,732	15,554,552	124,405,258

TABLE 61—*Continued*

Reference No.	Commodity	1912–13			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	995,249	86,726	6,553,141	31,759,774
356	Corn products	203,748	98,245	1,814,153	9,189,386
357	Rye products	10,701	1,416	123,843	565,476
358	Rice and products	15,840	397	156,420	711,928
359	Other cereals	26,114	10,293	145,068	798,429
	Sub-total—Grains	1,251,652	197,077	8,792,625	43,024,993
	Vegetables				
360	Legumes	70,279	4,830	184,215	1,089,145
361	Potatoes	136,412	7,578	1,114,025	5,197,962
362	Other vegetables	29,537	9,682	285,777	1,385,885
	Sub-total—Vegetables	236,228	22,090	1,584,017	7,672,992
363	Sugars	455	.....	4,104,958	16,835,176
	Fruits				
364	Apples	9,519	9,406	341,068	1,531,633
365	Oranges	1,589	397	30,558	133,866
366	Bananas	7,219	3,609	115,509	537,156
367	Other fruits	8,171	7,288	184,418	851,392
	Sub-total—Fruits	26,498	20,700	671,553	3,054,047
	Vegetable Oils and Nuts				
368	Nuts	43,369	81,228	32,932	1,068,492
369	Vegetable oils	.....	458,136	.....	4,262,661
370	Chocolate and cocoa	7,978	18,676	15,593	268,987
	Sub-total—Oils and Nuts	51,347	558,040	48,525	5,600,140
371	Fish	85,016	18,477	20	538,436
	Sub-total—All Primary	1,651,196	816,384	15,201,698	76,725,784
	Meats and Meat Products				
372	Beef and products	521,798	496,439	1,649	6,784,205
373	Pork and products	381,901	1,926,270	2,597	19,498,083
374	Mutton and products	48,677	70,612	542	859,246
	Sub-total—Meats	951,570	2,494,770	4,766	27,151,638
375	Poultry and eggs	239,584	168,659	.....	2,549,776
376	Oleomargarine	774	53,539	.....	501,291
377	Dairy products	720,632	1,358,126	872,694	19,179,262
	Sub-total—All Secondary	1,912,560	4,075,094	877,460	49,381,967
	Grand Total	3,563,756	4,891,478	16,079,158	126,107,751

TABLE 61—*Continued*

Reference No.	Commodity	1913–14			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	1,166,243	101,745	7,679,047	37,217,595
356	Corn products	202,368	97,263	1,802,353	9,126,239
357	Rye products	11,173	1,479	129,304	590,413
358	Rice and products	18,636	465	184,022	837,569
359	Other cereals	29,981	12,119	153,441	885,682
	Sub-total—Grains	1,428,401	213,071	9,953,167	48,657,498
	Vegetables				
360	Legumes	76,757	5,282	202,149	1,193,370
361	Potatoes	108,850	6,046	888,931	4,147,685
362	Other vegetables	28,605	9,178	286,216	1,379,545
	Sub-total—Vegetables	214,212	20,506	1,377,296	6,720,600
363	Sugars	455	.....	4,423,200	18,140,160
	Fruits				
364	Apples	5,792	5,701	207,210	930,502
365	Oranges	1,526	381	29,358	128,607
366	Bananas	8,222	4,111	131,567	611,836
367	Other fruits	6,656	7,608	150,045	708,077
	Sub-total—Fruits	22,196	17,801	518,180	2,379,022
	Vegetable Oils and Nuts				
368	Nuts	50,244	95,092	38,381	1,247,995
369	Vegetable oils	.....	541,477	.....	5,038,094
370	Chocolate and cocoa	10,200	23,885	19,931	343,932
	Sub-total—Oils and Nuts	60,444	660,454	58,312	6,630,021
371	Fish	86,108	18,563	18	543,899
	Sub-total—All Primary	1,811,816	930,395	16,330,173	83,071,200
	Meats and Meat Products				
372	Beef and products	507,758	486,631	1,583	6,634,517
373	Pork and products	364,500	1,855,128	2,482	18,764,355
374	Mutton and products	48,684	77,397	535	922,389
	Sub-total—Meats	920,379	2,419,465	4,586	26,321,773
375	Poultry and eggs	244,965	172,484	.....	2,607,319
376	Oleomargarine	770	53,261	.....	498,672
377	Dairy products	731,613	1,379,896	884,160	19,473,916
	Sub-total—All Secondary	1,897,727	4,025,106	888,746	48,901,680
	Grand Total	3,709,543	4,955,501	17,218,919	131,972,880

TABLE 61—*Continued*

Reference No.	Commodity	1914–15			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	978,806	85,316	6,446,223	31,240,761
356	Corn products	201,503	96,571	1,795,051	9,086,301
357	Rye products	11,228	1,486	129,936	593,297
358	Rice and products	13,427	337	132,597	603,495
359	Other cereals	28,572	11,601	149,850	840,310
	Sub-total—Grains	1,233,536	195,311	8,653,657	42,364,164
	Vegetables				
360	Legumes	68,833	4,869	179,423	1,063,900
361	Potatoes	132,339	7,353	1,080,780	5,042,836
362	Other vegetables	33,441	10,126	301,815	1,484,680
	Sub-total Vegetables	234,613	22,348	1,565,018	7,591,416
363	Sugars	455	.....	4,319,726	17,715,852
	Fruits				
364	Apples	10,256	10,141	367,567	1,650,637
365	Oranges	1,499	374	28,839	126,340
366	Bananas	6,914	3,447	110,304	512,951
367	Other fruits	7,878	6,607	169,753	783,643
	Sub-total—Fruits	26,547	20,569	676,463	3,073,571
	Vegetable Oils and Nuts				
368	Nuts	50,929	95,096	38,400	1,250,900
369	Vegetable oils	.....	595,041	.....	5,536,504
370	Chocolate and cocoa	9,195	21,574	17,954	310,281
	Sub-total—Oils and Nuts	60,124	711,711	56,354	7,097,685
371	Fish	86,796	18,732	19	548,479
	Sub-total—All Primary	1,642,071	968,671	15,271,237	78,391,167
	Meats and Meat Products				
372	Beef and products	508,717	490,365	1,662	6,673,341
373	Pork and products	416,899	2,157,916	2,873	21,797,474
374	Mutton and products	42,256	64,254	462	773,384
	Sub-total—Meats	967,165	2,707,408	4,980	29,193,531
375	Poultry and eggs	249,006	175,349	.....	2,650,480
376	Oleomargarine	765	52,917	.....	495,467
377	Dairy products	742,130	1,400,492	903,312	19,787,471
	Sub-total—All Secondary	1,959,066	4,336,166	908,292	52,126,949
	Grand Total	3,601,137	5,304,837	16,179,529	130,518,116

TABLE 61—*Continued*

Reference No.	Commodity	1915–16			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	1,159,286	101,146	7,636,118	37,007,387
356	Corn products	201,163	96,173	1,792,381	9,070,259
357	Rye products	11,480	1,519	132,856	606,633
358	Rice and products	16,677	417	164,691	749,578
359	Other cereals	32,131	13,292	161,941	920,265
	Sub-total—Grains	1,420,737	212,547	9,887,987	48,354,122
	Vegetables				
360	Legumes	59,607	4,145	153,757	913,944
361	Potatoes	115,422	6,412	942,629	4,398,237
362	Other vegetables	32,292	10,998	346,643	1,660,414
	Sub-total—Vegetables	207,321	21,555	1,443,029	6,972,595
363	Sugars	455	.....	4,047,276	16,598,665
	Fruits				
364	Apples	9,610	9,567	345,335	1,550,836
365	Oranges	1,523	379	29,286	128,293
366	Bananas	6,169	3,085	98,717	459,065
367	Other fruits	9,295	9,174	206,025	961,649
	Sub-total—Fruits	26,597	22,205	679,363	3,099,843
	Vegetable Oils and Nuts				
368	Nuts	47,957	99,492	36,507	1,271,900
369	Vegetable oils	.....	424,858	.....	3,953,026
370	Chocolate and cocoa	11,880	27,881	23,200	400,975
	Sub-total—Oils and Nuts	59,837	552,231	59,707	5,625,901
371	Fish	79,968	16,045	20	495,706
	Sub-total—All Primary	1,794,915	824,583	16,117,382	81,146,832
	Meats and Meat Products				
372	Beef and products	525,129	502,065	1,740	6,850,539
373	Pork and products	405,161	2,143,483	2,929	21,614,254
374	Mutton and products	40,286	62,637	439	750,130
	Sub-total—Meats	969,077	2,700,434	5,076	29,136,535
375	Poultry and eggs	252,314	177,696	.....	2,685,822
376	Oleomargarine	800	55,375	.....	518,470
377	Dairy products	764,377	1,445,669	919,595	20,366,131
	Sub-total—All Secondary	1,986,568	4,379,174	924,671	52,706,958
	Grand Total	3,781,483	5,203,757	17,042,053	133,853,790

TABLE 61—*Continued*

Reference No.	Commodity	1916-17			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	1,026,976	89,506	6,765,024	32,784,510
356	Corn products	201,709	96,269	1,797,497	9,094,401
357	Rye products	12,245	1,621	141,725	647,129
358	Rice and products	25,331	634	250,140	1,138,508
359	Other cereals	39,298	16,587	189,036	1,091,501
	Sub-total—Grains	1,305,559	204,617	9,143,422	44,756,049
	Vegetables				
360	Legumes	75,821	5,200	198,157	1,172,609
361	Potatoes	93,703	5,205	765,232	3,570,508
362	Other vegetables	28,284	10,021	317,522	1,514,539
	Sub-total—Vegetables	197,808	20,426	1,280,911	6,257,656
363	Sugars	455	.....	4,356,901	17,868,295
	Fruits				
364	Apples	8,490	8,461	305,219	1,370,683
365	Oranges	2,176	544	41,912	183,597
366	Bananas	5,778	2,889	92,457	429,960
367	Other fruits	7,227	8,429	167,517	790,038
	Sub-total—Fruits	23,671	20,323	607,105	2,774,278
	Vegetable Oils and Nuts				
368	Nuts	47,957	105,623	36,717	1,329,746
369	Vegetable oils	.....	547,294	.....	5,092,191
370	Chocolate and cocoa	18,554	43,530	36,235	626,117
	Sub-total—Oils and Nuts	66,511	696,447	72,952	7,048,054
371	Fish	84,275	17,582	23	527,725
	Sub-total—All Primary	1,678,279	959,395	15,461,314	79,232,057
	Meats and Meat Products				
372	Beef and products	562,748	538,151	1,881	7,342,374
373	Pork and products	398,781	2,098,923	2,895	21,173,213
374	Mutton and products	36,589	56,626	406	678,884
	Sub-total—Meats	996,527	2,685,983	5,146	29,115,663
375	Poultry and eggs	255,499	179,999	.....	2,720,161
376	Oleomargarine	1,238	85,658	.....	802,605
377	Dairy products	783,350	1,482,331	937,858	20,860,208
	Sub-total—All Secondary	2,036,614	4,433,971	943,004	53,498,037
	Grand Total	3,714,893	5,393,366	16,404,318	132,730,094

TABLE 61—*Continued*

Reference No.	Commodity	1917–18			
		Protein in metric tons	Fat in metric tons	Carbohydrate in metric tons	Calories in millions
	Grains and Derivative Products				
355	Wheat and products	940,543	81,835	6,195,182	30,021,979
356	Corn products	242,395	118,845	2,155,310	10,938,521
357	Rye products	24,597	3,256	284,668	1,299,820
358	Rice and products	30,725	767	303,428	1,381,039
359	Other cereals	65,088	23,104	352,857	1,927,964
	Sub-total—Grains	1,303,348	227,807	9,291,445	45,569,323
	Vegetables				
360	Legumes	105,578	7,325	277,203	1,638,716
361	Potatoes	143,167	7,953	1,169,204	5,455,418
362	Other vegetables	36,668	12,586	398,275	1,904,998
	Sub-total—Vegetables	285,413	27,864	1,844,682	8,999,132
363	Sugars	439	.....	4,374,194	17,939,129
	Fruits				
364	Apples	7,458	7,451	268,425	1,205,454
365	Oranges	1,109	278	21,360	93,569
366	Bananas	5,771	2,885	92,328	429,360
367	Other fruits	9,283	6,767	219,237	994,221
	Sub-total—Fruits	23,621	17,381	601,350	2,722,604
	Vegetable Oils and Nuts				
368	Nuts	81,939	179,337	63,054	2,262,988
369	Vegetable oils	.....	554,851	.....	5,162,528
370	Chocolate and cocoa	20,083	47,273	39,177	678,641
	Sub-total—Oils and Nuts	102,022	781,461	102,231	8,104,157
371	Fish	85,021	17,866	25	533,419
	Sub-total—All Primary	1,799,864	1,072,379	16,213,927	83,867,764
	Meats and Meat Products				
372	Beef and products	539,703	513,596	1,577	7,017,398
373	Pork and products	378,799	2,045,653	2,859	20,594,616
374	Mutton and products	28,298	46,853	315	553,498
	Sub-total—Meats	945,277	2,602,187	4,717	28,122,722
375	Poultry and eggs	248,772	175,220	.....	2,648,262
376	Oleomargarine	1,808	125,024	.....	1,170,593
377	Dairy products	788,969	1,505,129	917,169	21,010,397
	Sub-total—All Secondary	1,984,826	4,407,560	921,886	52,951,974
	Grand Total	3,784,690	5,479,939	17,135,813	136,819,738

The data of Table 61 are summarized by years in Table 62, and are shown graphically in Figs. 30 and 31.

TABLE 62.—SUMMARY OF CONSUMPTION OF HUMAN FOODS, PRIMARY AND SECONDARY

(Metric Tons)

Years	Protein	Per cent. from		Fat	Per cent. from		Carbohydrate	Per cent. from		Calories (millions)	Per cent from	
		Primary	Secondary		Primary	Secondary		Primary	Secondary		Primary	Secondary
1911–12	3,556,616	45	55	4,942,732	17	83	15,554,552	94	6	124,405,258	60	40
1912–13	3,563,756	46	54	4,891,478	17	83	16,079,158	95	5	126,107,751	61	39
1913–14	3,709,543	49	51	4,955,501	19	81	17,218,919	95	5	131,972,880	63	37
1914–15	3,601,137	48	52	5,091,857	18	82	16,179,529	94	6	130,515,116	60	40
1915–16	3,781,483	47	53	5,203,757	16	84	17,042,053	95	5	133,853,790	61	39
1916–17	3,714,893	45	55	5,393,366	18	82	16,404,318	94	6	132,730,094	60	40
1917–18	3,784,090	48	52	5,479,939	20	80	17,135,813	95	5	136,819,738	61	39
Total for 7 years	25,711,518	47	53	35,171,610	18	82	115,614,342	95	5	916,407,627	61	39
Average, whole period	3,673,074	47	53	5,167,373	18	82	16,516,335	95	5	130,915,375	61	39
Average, 1911–12 to 1916–17	3,654,571	46	54	5,115,279	17	83	16,413,088	95	5	129,931,315	61	39

The first thing which impresses one about the consumption figures is their extreme uniformity from year to year, as compared with production, exports, imports, with which we have hitherto dealt. This is exactly what would be expected, of course. No matter how much production, exports and imports may fluctuate, within rather wide limits, the people of this country eat about the same amount

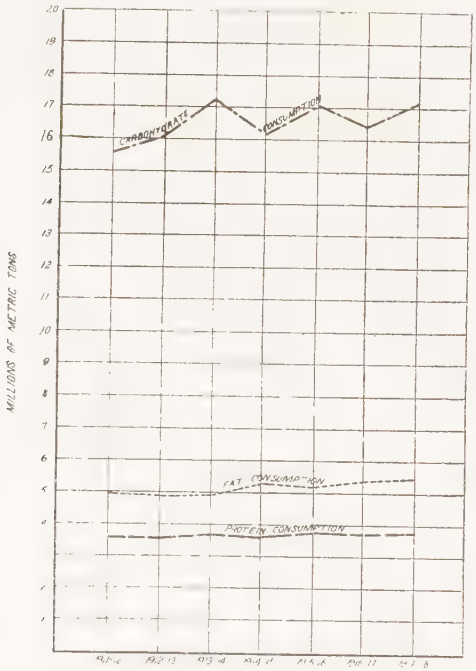

FIG. 30.—Showing the course of human food consumption in the United States from 1911 to 1918. Absolute figures in metric tons. Dash line denotes protein content of human food consumed; dot line denotes fat content; and dot-dash line denotes carbohydrate content.

each year. To have the statistical calculation come out to this result so beautifully is strong evidence of the correctness of the long and tedious preliminary calculations which have been presented in the earlier chapters. There has been a rather steady small increase in total gross food consumption, but as Fig. 31 so plainly shows, this has been very closely proportional to the increase in the population.

In the seven year period here discussed the greatest relative advance in consumption was in respect of fat, and the least relative advance in respect of protein. Carbohydrate content and calories increased in the seven years in amount consumed to a degree intermediate between fat and protein. The protein relative line falls below the population relative line each year after 1913–14. This

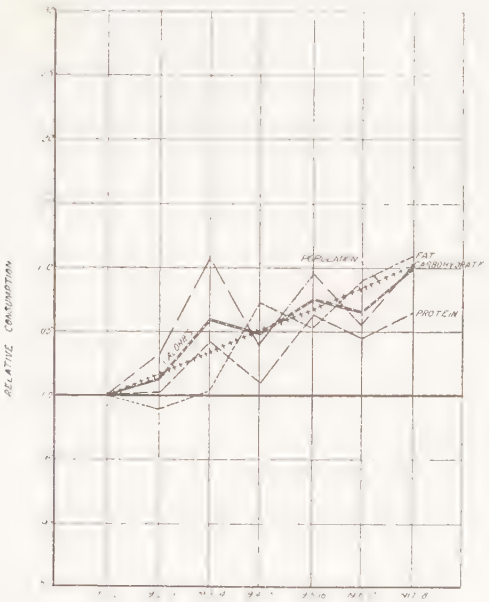

Fig. 31.—Relative curves for human food consumption. The figure for the year 1911–12 is taken as 100 in each case and the relative figure for each year calculated to that base. The population curve is included for comparison. Solid line denotes calories; dash line, protein; dot line, fat; dot-dash line, carbohydrate; circle line, population.

means that since 1913–14 somewhat less protein has been consumed in gross in proportion to the population. The relative line for fat was below the population line till 1914–15, and thereafter followed it closely.

The relative figures from which Fig. 31 is plotted are given in Table 63.

With such gratifying assurance of the smoothness of the consumption results we may proceed to an analytical discussion of the numerous highly interesting problems which center about human food consumption, and for which data have hitherto been lacking.

TABLE 63.—CONSUMPTION OF HUMAN FOODS, PRIMARY AND SECONDARY, RELATIVE TO 1911–12, TAKEN AS 100

Years	Population	Protein	Fat	Carbohydrate	Calories (millions)
1911–12	100.0	100.0	100.0	100.0	100.0
1912–13	101.7	100.2	99.0	103.4	101.4
1913–14	103.4	104.3	100.3	110.7	106.1
1914–15	105.1	101.3	107.3	104.0	104.9
1915–16	106.8	106.3	105.3	109.6	107.6
1916–17	108.5	104.5	109.1	105.5	106.7
1917–18	110.2	106.4	110.9	110.2	110.0
Average, whole period.....	105.1	103.3	104.6	106.2	105.2
Average, 1911–12 to 1916–17	104.3	102.8	103.5	105.5	104.5

The first of such problems to which attention may be turned is: To what relative degree do primary, as distinguished from secondary, human foods contribute to the total nutritional intake of our population? From Table 62 it is seen that 47 per cent. of the protein consumed comes from primary sources and 53 per cent. from secondary sources. Thus, broadly speaking, the American people get over one-half of their protein from animal sources, exclusive of fish, which are included in the primary foods. This fact indicates at once the importance of maintaining the nation's animal herds intact and keeping the price of animal products at not too high a level, unless we are prepared to face the alternative of a radical and fundamental alteration in the established dietary habits of the people.

In general there has been but little change in this protein-source dietary habit in the seven years included in this study. What change there has been is in the direction of a smaller proportion of protein from secondary sources and a larger from primary, but the movement has been but slight. As would be expected, a much larger proportion of the total fat consumed in human food comes from secondary sources than is the case with protein. The figures are 82 per cent. from secondary sources and 18 per cent. from primary. Again there has been little change in the seven years. In spite of all propaganda from dietary cranks and from commercial interests it is clear that the American people depend to an overwhelming degree upon animal sources for their fat intake, rather

than upon vegetable oils, nuts and the like. This condition is naturally reversed as regards carbohydrate. Ninety-four per cent. of this nutrient comes from primary sources and only 5 from secondary. In the total nutritional calory intake 61 per cent. comes from primary foods and 39 per cent. from secondary.

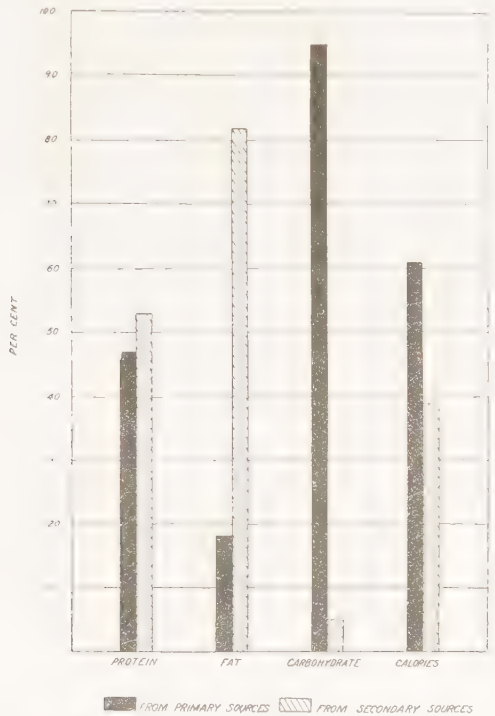

FIG. 32.—Diagram showing the percentages of the total nutritional intake of the American people derived from primary and secondary sources.

It is interesting to compare the percentage of American nutritional intake derived from primary and secondary sources with corresponding British figures. Calculating roughly from Table I of the official British report[1] on the subject I find that 42 per cent. of the protein intake, 92 per cent. of the fat intake, and 35 per cent. of the energy value of the total nourishment of the population of

[1] The Food Supply of the United Kingdom. A report drawn up by a Committee of the Royal Society at the request of the Board of Trade. London (Cd. 8421), 1917, p. 35.

the United Kingdom comes from *secondary* sources. In other words, the British get less of their protein and calories and more of their fat from animal products exclusive of fish than the Americans do. The differences, however, are not great, indicating generally similar dietary habits in the two populations, a fact which is known on general grounds to be true.

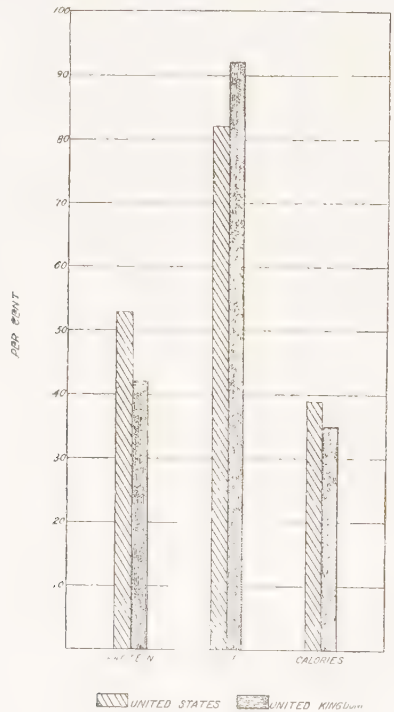

FIG. 33.—Diagram showing the relative proportions of the American and the British food intake derived from animal sources (exclusive of fish).

The above comparisons regarding primary and secondary sources of human food are shown graphically in Figs. 32 and 33.

The next problem concerns the relative proportion of the total nutritional intake furnished by the several different large food commodity classes. The data on this point for the main groups are collected in Tables 64 to 67 inclusive. The arrangement of these tables is to give first the annual average for the six years preceding the entrance of the United States into the war, and then to give

1917–18, our first year in the war, separately. The reason for such a time division is obvious. There is no reason to suppose that the consumption of food in this country was affected by the war till the time we entered and the United States Food Administration began its work. Before then the population had gone on consuming food at about the usual normal rate. There was no reason or incentive to do otherwise, except in so far as price had an influence. But in 1917–18 a wholly new and extraordinary influence was brought into play to alter the national food habits. This was the Food Administration, which through its recommendations, on the one hand, and regulations on the other hand, sought to modify the consumption rate of certain commodities and succeeded in doing so, as will presently appear in detail.

In Tables 64 to 67 the percentage figures are first given separately and then accumulated to 100 in another column.

The data of Tables 64 to 67 are shown graphically in Fig. 34.

From these tables and diagrams it is seen that the grains stand at the head of the list in contribution of protein, carbohydrate and calories. Meats come first in contribution of fat, second in protein and calories. Thirty-six per cent. of our protein intake normally is in the form of grain, 26 per cent. in meats and 20 per cent. in dairy products. These three great commodity groups together make up nearly 83 per cent. of the total protein intake.

The total consumption of human food was absolutely higher in 1917–18 than the average of the preceding six years. This is to be expected from the increase of the population, and means nothing till converted to relative terms. But the proportion of the total contributed by the grains and meats is smaller in 1917–18. In other words, the two great commodity groups on which the most stress was laid in the conservation campaign of the Food Administration show an absolute reduction in the part which they play in nutrition. The effect of the conservation work will, however, be more clearly shown when we come to the consideration of individual commodities.

Of the fat normally consumed 51 per cent. is furnished by the meats as a group; 27 per cent. by the dairy products; and 12 per cent. by the vegetable oils and nuts. The grains normally furnish 3.98 per cent. of the fat intake and in 1917–18 this rose slightly to 4.16, due to the increased consumption of cornmeal.

TABLE 64.—CONSUMPTION OF PROTEIN IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, ARRANGED BY GROUPS IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17				For 1917–18			
Group	Absolute consumption of protein (metric tons)	Percentage consumption	Cumulated per cent.	Group	Absolute consumption of protein (metric tons)	Percentage consumption	Cumulated per cent.
Grains	1,316,140	36.01	36.01	Grains	1,303,348	34.44	34.44
Meats	964,117	26.38	62.39	Meats	945,277	24.98	59.42
Dairy products	744,784	20.38	82.77	Dairy products	788,969	20.85	80.27
Poultry and eggs	246,178	6.74	89.51	Vegetables	285,413	7.54	87.81
Vegetables	214,404	5.87	95.38	Poultry and eggs	248,772	6.57	94.38
Fish	84,852	2.32	97.70	Oils and nuts	102,022	2.69	97.07
Oils and nuts	57,839	1.58	99.28	Fish	85,021	2.25	99.32
Fruits	24,965	0.69	99.97	Fruits	23,621	0.62	99.94
Oleomargarine	838	0.02	99.99	Oleomargarine	1,808	0.05	99.99
Sugars	455	0.01	100.00	Sugars	439	0.01	100.00
Total	3,654,572	100.00	.....	Total	3,784,690	100.00	

TABLE 65.—CONSUMPTION OF FAT IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, ARRANGED BY GROUPS IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17				For 1917–18			
Group	Absolute consumption of fat (metric tons)	Percentage consumption	Cumulated per cent	Group	Absolute consumption of fat (metric tons)	Percentage consumption	Cumulated per cent.
Meats	2,591,613	50.66	50.66	Meats	2,602,187	47.48	47.48
Dairy products	1,405,918	27.49	78.15	Dairy products	1,505,129	27.46	74.94
Oils and nuts	623,385	12.19	90.34	Oils and nuts	781,461	14.26	89.20
Grains	203,585	3.98	94.32	Grains	227,807	4.16	93.36
Poultry and eggs	173,349	3.39	97.71	Poultry and eggs	175,220	3.20	96.56
Oleomargarine	57,965	1.13	98.84	Oleomargarine	125,024	2.28	98.84
Vegetables	21,126	0.41	99.25	Vegetables	27,864	0.51	99.35
Fruits	20,242	0.40	99.65	Fish	17,866	0.33	99.68
Fish	18,096	0.35	100.00	Fruits	17,381	0.32	100.00
Sugars	0	0	100.00	Sugars	0	0	100.00
Total	5,115,279	100.00		Total	5,479,939	100.00	

TABLE 66.—CONSUMPTION OF CARBOHYDRATE IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, ARRANGED BY GROUPS IN ORDER OF MAGNITUDE

For the six years, 1911–12 to 1916–17				For 1917–18			
Group	Absolute consumption of carbohydrate (metric tons)	Percentage consumption	Cumulated per cent.	Group	Absolute consumption of carbohydrate (metric tons)	Percentage consumption	Cumulated per cent.
Grains	9,208,939	56.1073	56.1073	Grains	9,291,445	54.2224	54.2224
Sugars	4,193,095	25.5473	81.6546	Sugars	4,374,194	25.5266	79.7490
Vegetables	1,421,851	8.6629	90.3175	Vegetables	1,844,682	10.7651	90.5141
Dairy products	899,691	5.4815	95.7990	Dairy products	917,169	5.3524	95.8665
Fruits	627,487	3.8231	99.6221	Fruits	601,350	3.5093	99.3758
Oils and nuts	57,097	0.3479	99.9700	Oils and nuts	102,231	0.5966	99.9724
Meats	4,907	0.0299	99.9999	Meats	4,717	0.0275	99.9999
Fish	20	0.0001	100.0000	Fish	25	0.0001	100.0000
Poultry and eggs	0	0	100.0000	Poultry and eggs	0	0	100.0000
Oleomargarine	0	0	100.0000	Oleomargarine	0	0	100.0000
Total	16,413,087	100.0000	.....	Total	17,135,813	100.0000	.....

TABLE 67.—CONSUMPTION OF HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, IN TERMS OF CALORIC VALUE, ARRANGED BY GROUPS IN ORDER OF MAGNITUDE

For the six years, 1911–12 to 1916–17				For 1917–18			
Group	Absolute consumption (million calories)	Percentage consumption	Cumulated per cent.	Group	Absolute consumption (million calories)	Percentage consumption	Cumulated per cent.
Grains	45,057,265	34.68	34.68	Grains	45,569,323	33.31	33.31
Meats	28,104,069	21.63	56.31	Meats	28,122,722	20.55	53.86
Dairy products	19,834,010	15.26	71.57	Dairy products	21,010,397	15.36	69.22
Sugars	17,196,595	13.24	84.81	Sugars	17,939,129	13.11	82.33
Vegetables	6,910,026	5.32	90.13	Vegetables	8,999,132	6.58	88.91
Oil and nuts	6,269,270	4.82	94.95	Oil and nuts	8,104,157	5.92	94.83
Fruits	2,862,540	2.20	97.15	Fruits	2,722,604	1.99	96.82
Poultry and eggs	2,620,311	2.02	99.17	Poultry and eggs	2,648,262	1.93	98.75
Oleomargarine	542,719	0.42	99.59	Oleomargarine	1,170,593	0.86	99.61
Fish	534,509	0.41	100.00	Fish	533,419	0.39	100.00
Total	129,931,314	100.000		Total	136,819,738	100.00	

The sugars stand second in the list as contributors of carbohydrate to consumption, with 26 per cent. of the total, to which 56 per cent. is furnished by the grains. Of the remainder of the carbohydrate intake vegetables normally contribute about 9 per cent., the dairy products 5 per cent. and the fruit 4 per cent.

FIG. 34.—Showing the percentage contribution of the different great food commodity groups to the nutritional intake of the United States, for (*a*) six years before our entry into the war and (*b*) 1917–1918.

The energy values of the groups are especially interesting as furnishing a general index of food values. Of the total energy furnished by the human food consumed 35 per cent. comes from the grains, 22 per cent. from the meats, 15 per cent. from the dairy products and 13 per cent. from the sugars. These four groups make up about 85 per cent. of the total energy value of all the food consumed. Vegetables contribute only about 5 per cent. fruit and poultry about 2 per cent. each, and vegetable oils and nuts nearly 5 per cent.

On the basis of Table 67 it is of interest to examine somewhat more carefully the changes in consumption rate in 1917–18 as compared with the average of the six preceding years. Such a comparison is made in Table 68 and shown graphically in Fig. 35.

TABLE 68.—SHOWING THE CHANGES IN FOOD CONSUMPTION IN THE UNITED STATES IN 1917–18 AS COMPARED WITH THE AVERAGE ANNUAL CONSUMPTION IN THE SIX PRECEDING YEARS

(Millions of Calories)

Group	Increase of consumption in 1917–18 over 6 year average	Decrease of consumption in 1917–18 under 6 year average	Percentage increase	Percentage decrease
Grains	512,058	.....	1.14	.....
Meats	18,653	.....	0.07	
Dairy products	1,176,387	.	5.93	
Sugars	742,534	.....	4.32	.....
Vegetables	2,089,106	.....	30.23	.....
Oils and nuts	1,834,887	.	29.27	
Fruits	.....	139,936	.....	4.89
Poultry and eggs	27,951	.....	1.07	.....
Oleomargarine	627,874	.....	115.69	.....
Fish		1,090		0.20
Total	6,888,424	.....	5.30	.....
Population	5,662,979		5.73	

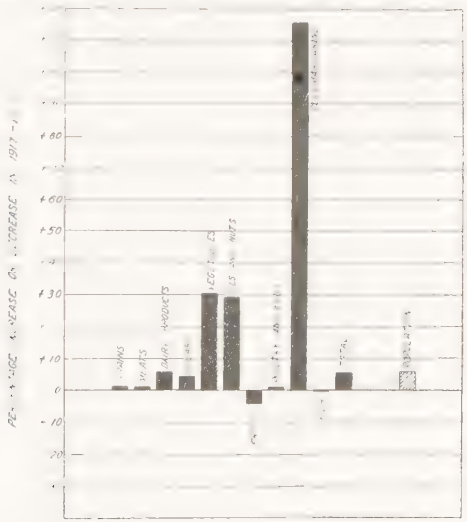

FIG. 35.—Diagram showing the increase or decrease in food consumption in 1917–18 as compared with the average of the preceding six years.

From Table 68 and the diagram it is observed that the total increase in human food consumption in 1917–18 was less (nearly ½ per cent.) proportionately than the increase in population, both being compared with the average of the six preceding years. The consumption of meats practically did not increase at all, and the consumption of grains only about 1 per cent.

The great increases were first in the consumption of vegetables and oils and nuts, amounting to 30 per cent. in the one case and 29 per cent. in the other, and second in oleomargarine where the consumption increased nearly 116 per cent. in 1917–18 over the average of the preceding six years. In the case of vegetables and oils and nuts the increased consumption in 1917–18 is probably to be attributed largely to the activity of the Food Administration in urging the consumption of these commodities to afford a relief of the pressure on wheat and meat products. In the case of oleomargarine the increased consumption is clearly due entirely to a favorable price differential as compared with butter and lard, taking into account palatability.

The only two great commodity groups showing decreases in consumption in 1917–18 are fruits and fish. In both cases the result is probably to be explained by price influences, taken together with palatability and popular ideas as to relative necessity in the diet. For example the price of meat may rise relatively much more than that of fruits or fish without leading to any reduction in consumption, owing to the general belief that meat is a more necessary article of diet than the other two sorts of food mentioned.

We may next consider the gross consumption of individual commodities on the same plan that has just been used in handling the groups. The data are given in Tables 69 to 72, inclusive. In these tables it will be noted that the cumulated percentage columns run to more than 100 per cent. by trifling amounts. This is to take care of the item "other meat products" which appears in the net export table but not in production. In the main consumption table it is carried into the sub-total "Meats" but does not appear as a separate item, because of the impossibility of calculating it as such.

The data of Tables 69 to 72 inclusive are shown, exhibited graphically in Figs. 36 to 39.

TABLE 69.—CONSUMPTION OF PROTEIN IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, ARRANGED BY COMMODITIES IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17					For 1917–18				
Order No.	Commodity	Absolute consumption of protein (metric tons)	Percentage consumption	Cumulated per cent.	Order No.	Commodity	Absolute consumption of protein (metric tons)	Percentage consumption	Cumulated per cent.
1	Wheat	1,054,548	28 85	28 85	1	Wheat	940,543	24 85	24 85
2	Dairy products	744,784	20 38	49 23	2	Dairy products	788,969	20 85	45 70
3	Beef	528,709	14 47	63 70	3	Beef	539,703	14 26	59 96
4	Pork	392,665	10 74	74 44	4	Pork	378,799	10 01	69 97
5	Poultry and eggs	246,178	6 74	81 18	5	Poultry and eggs	248,772	6 57	76 54
6	Corn	202,717	5 55	86 73	6	Corn	242,395	6 40	82 94
7	Potatoes	113,598	3 14	89 87	7	Potatoes	143,167	3 78	86 72
8	Fish	84,852	2 32	92 19	8	Legumes	105,578	2 79	89 51
9	Legumes	69,669	1 91	94 10	9	Fish	85,021	2 25	91 76
10	Nuts	46,819	1 28	95 38	10	Nuts	81,939	2 16	93 92
11	Mutton	43,712	1 20	96 58	11	Other cereals	65,088	1 72	95 64
12	Other cereals	30,471	0 83	97 41	12	Other vegetables	36,668	0 97	96 61
13	Other vegetables	30,137	0 82	98 23	13	Rice	30,725	0 81	97 42
14	Rice	17,231	0 47	98 70	14	Mutton	28,298	0 75	98 17
15	Rye	11,174	0 31	99 01	15	Rye	24,597	0 65	98 82
16	Cocoa	11,020	0 30	99 31	16	Cocoa	20,083	0 53	99 35
17	Apples	8,719	0 24	99 55	17	Other fruits	9,283	0 25	99 60
18	Other fruits	7,620	0 21	99 76	18	Apples	7,458	0 20	99 80
19	Bananas	6,979	0 19	99 95	19	Bananas	5,771	0 15	99 95
20	Oranges	1,647	0 04	99 99	20	Oleomargarine	1,808	0 05	100 00
21	Oleomargarine	838	0 02	100 01	21	Oranges	1,109	0 03	100 03
22	Sugars	455	0 01	100 02	22	Sugars	439	0 01	100 04
	Oils	0	0	100 02	...	Oils	0	0	100 04
	Total	3,671,572					3,784,690		

TABLE 70.—CONSUMPTION OF FAT IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, ARRANGED BY COMMODITIES IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17					For 1917–18				
Order No.	Commodity	Absolute consumption of fat (metric tons)	Percentage consumption	Cumulated per cent.	Order No.	Commodity	Absolute consumption of fat (metric tons)	Percentage consumption	Cumulated per cent.
1	Pork	2,024,236	39.57	39.57	1	Pork	2,045,653	37.33	37.33
2	Dairy products	1,405,918	27.49	67.06	2	Dairy products	1,505,129	27.46	64.79
3	Oils	505,201	9.88	76.94	3	Oils	554,851	10.13	74.92
4	Beef	505,033	9.87	86.81	4	Beef	513,596	9.37	84.29
5	Poultry and eggs	173,349	3.39	90.20	5	Nuts	179,337	3.27	87.56
6	Corn	97,355	1.90	92.10	6	Poultry and eggs	175,220	3.20	90.76
7	Nuts	92,348	1.81	93.91	7	Oleomargarine	125,024	2.28	93.04
8	Wheat	91,929	1.80	95.71	8	Corn	118,845	2.17	95.21
9	Mutton	65,499	1.28	96.99	9	Wheat	81,835	1.49	96.70
10	Oleomargarine	57,965	1.13	98.12	10	Cocoa	47,273	0.86	97.56
11	Cocoa	25,836	0.51	98.63	11	Mutton	46,853	0.86	98.42
12	Fish	18,096	0.35	98.98	12	Other cereals	23,104	0.42	98.84
13	Other cereals	12,391	0.24	99.22	13	Fish	17,866	0.33	99.17
14	Other vegetables	9,935	0.19	99.41	14	Other vegetables	12,586	0.23	99.40
15	Apples	8,629	0.17	99.58	15	Potatoes	7,953	0.15	99.55
16	Other fruits	7,713	0.15	99.73	16	Apples	7,451	0.14	99.69
17	Potatoes	6,366	0.12	99.85	17	Legumes	7,325	0.13	99.82
18	Legumes	4,824	0.09	99.94	18	Other fruits	6,767	0.12	99.94
19	Bananas	3,488	0.07	100.01	19	Rye	3,256	0.06	100.00
20	Rye	1,479	0.03	100.04	20	Bananas	2,885	0.05	100.05
21	Rice	431	0.01	100.05	21	Rice	767	0.01	100.06
22	Oranges	411	0.01	100.06	22	Oranges	278	0.01	100.07
	Sugars	0	0	100.06	...	Sugars	0	0	100.07
	Total	5,115,279	.....	.....			5,479,939	....	.....

TABLE 71.—CONSUMPTION OF CARBOHYDRATE IN HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES. ARRANGED BY COMMODITIES IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17					For 1917–18				
Order No.	Commodity	Absolute consumption of carbohydrate (metric tons)	Percentage consumption	Cumulated per cent.	Order No.	Commodity	Absolute consumption of carbohydrate (metric tons)	Percentage consumption	Cumulated per cent.
1	Wheat	6,944,794	42.3125	42.3125	1	Wheat	6,195,182	36.1534	36.1534
2	Sugars	4,193,095	25.5473	67.8598	2	Sugars	4,374,194	25.5266	61.6800
3	Corn	1,805,564	11.0008	78.8606	3	Corn	2,155,310	12.5778	74.2578
4	Potatoes	935,881	5.7020	84.5626	4	Potatoes	1,169,204	6.8232	81.0810
5	Dairy products	899,691	5.4815	90.0441	5	Dairy products	917,169	5.3524	86.4334
6	Apples	312,589	1.9045	91.9486	6	Other vegetables	398,275	2.3242	88.7576
7	Other vegetables	303,868	1.8514	93.8000	7	Other cereals	352,857	2.0592	90.8168
8	Legumes	182,103	1.1095	94.9095	8	Rice	303,428	1.7707	92.5875
9	Other fruits	171,574	1.0454	95.9549	9	Rye	284,668	1.6612	94.2487
10	Rice	170,151	1.0367	96.9916	10	Legumes	277,203	1.6177	95.8664
11	Other cereals	159,113	0.9694	97.9610	11	Apples	268,425	1.5665	97.4329
12	Rye	129,318	0.7879	98.7489	12	Other fruits	219,237	1.2794	98.7123
13	Bananas	111,628	0.6801	99.4290	13	Bananas	92,328	0.5388	99.2511
14	Nuts	35,571	0.2167	99.6457	14	Nuts	63,054	0.3680	99.6191
15	Oranges	31,696	0.1931	99.8388	15	Cocoa	39,177	0.2286	99.8477
16	Cocoa	21,526	0.1312	99.9700	16	Oranges	21,360	0.1247	99.9724
17	Pork	2,740	0.0167	99.9867	17	Pork	2,859	0.0167	99.9891
18	Beef	1,707	0.0104	99.9971	18	Beef	1,577	0.0092	99.9983
19	Mutton	484	0.0029	100.0000	19	Mutton	315	0.0018	100.0001
20	Fish	20	0.0001	100.0001	20	Fish	25	0.0001	100.0002
	Oils	0	0	100.0001	...	Oils	0	0	100.0002
	Poultry and eggs	0	0	100.0001	...	Poultry and eggs	0	0	100.0002
	Oleomargarine	0	0	100.0001	...	Oleomargarine	0	0	100.0002
	Total	16,435,087					17,135,813		

TABLE 72.—CONSUMPTION OF HUMAN FOODS, PRIMARY AND SECONDARY, IN THE UNITED STATES, IN TERMS OF CALORIC VALUE, ARRANGED BY COMMODITIES IN ORDER OF MAGNITUDE

Average for the six years, 1911–12 to 1916–17					For 1917–18				
Order No.	Commodity	Absolute consumption (million calories)	Percentage consumption	Cumulated per cent.	Order No.	Commodity	Absolute consumption (million calories)	Percentage consumption	Cumulated per cent.
1	Wheat	33,657,299	25.90	25.90	1	Wheat	30,021,979	21.94	21.94
2	Pork	20,453,649	15.74	41.64	2	Dairy products	21,010,397	15.36	37.30
3	Dairy products	19,834,010	15.26	56.90	3	Pork	20,594,616	15.05	52.35
4	Sugars	17,196,595	13.24	70.14	4	Sugars	17,939,129	13.11	65.46
5	Corn	9,141,678	7.03	77.17	5	Corn	10,938,521	7.99	73.45
6	Beef	6,892,851	5.30	82.47	6	Beef	7,017,398	5.13	78.58
7	Oils	4,700,590	3.62	86.09	7	Potatoes	5,455,418	3.99	82.57
8	Potatoes	4,366,750	3.36	89.45	8	Oils	5,162,528	3.77	86.34
9	Poultry and eggs	2,620,311	2.02	91.47	9	Poultry and eggs	2,648,262	1.94	88.28
10	Other vegetables	1,465,344	1.13	92.60	10	Nuts	2,262,988	1.65	89.93
11	Apples	1,403,750	1.08	93.68	11	Other cereals	1,927,964	1.41	91.34
12	Nuts	1,196,911	0.92	94.60	12	Other vegetables	1,904,998	1.39	92.73
13	Legumes	1,077,932	0.83	95.43	13	Legumes	1,638,716	1.20	93.93
14	Other cereals	893,383	0.69	96.12	14	Rice	1,381,039	1.01	94.94
15	Other fruits	800,831	0.62	96.74	15	Rye	1,299,820	0.95	95.89
16	Mutton	791,032	0.61	97.35	16	Apples	1,205,454	0.88	96.77
17	Rice	774,430	0.60	97.95	17	Oleomargarine	1,170,593	0.86	97.63
18	Rye	590,475	0.45	98.40	18	Other fruits	994,221	0.73	98.36
19	Oleomargarine	542,719	0.42	98.82	19	Cocoa	678,641	0.50	98.86
20	Fish	534,509	0.41	99.23	20	Mutton	553,498	0.40	99.26
21	Bananas	519,109	0.40	99.63	21	Fish	533,419	0.39	99.65
22	Cocoa	371,769	0.29	99.92	22	Bananas	429,360	0.31	99.96
23	Oranges	138,850	0.11	100.03	23	Oranges	93,569	0.07	100.03
	Total	129,931,314	.....	.....			136,819,738	.....	.....

Taking first the protein consumption, as given in Table 69, it is seen that wheat stands at the head of the list as a source of protein for the population of this country, contributing nearly 29 per cent. normally to the total. Dairy products are second with 20 per cent. of the total. Beef with 14 per cent. and pork with 11 per cent.

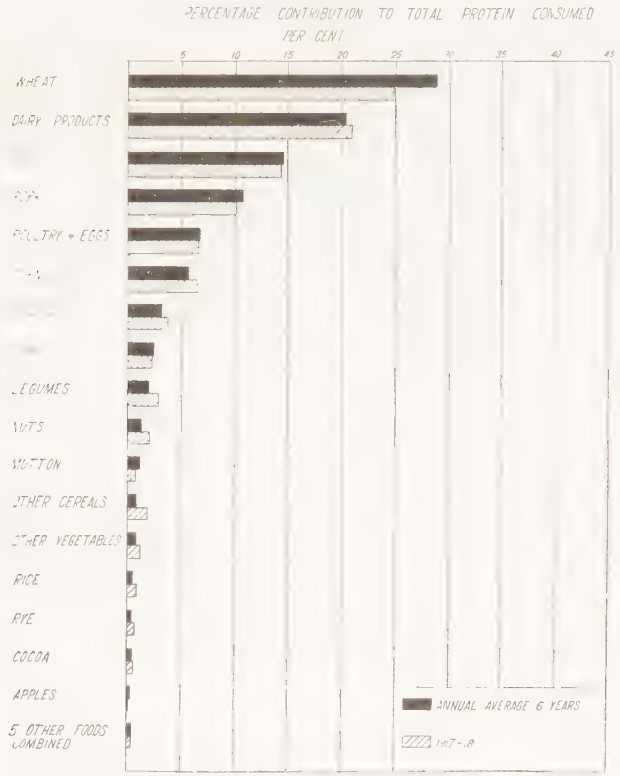

FIG. 36.—Diagram showing the percentage of the total protein consumed in the United States contributed by each of 23 commodities. The solid bars denote the average consumption in the six years preceding our entry into the war. The cross hatched bars denote the consumption in 1917 and 1918.

stand next. The other commodities contributing more than 2 per cent. to the total protein intake of the population are, in the order named: Poultry and eggs, corn, potatoes and fish. Taken together, these 8 commodities furnish 92 per cent. of the total protein intake. We see here again, just as in the case of the production tables, that a very few commodities furnish a very large

percentage of the nutritional intake. This fact, in and of itself, helps enormously toward the possibility of making an investigation such as this substantially accurate in its results. It is clear that the minor items omitted from the calculations have no significance in the final general result. If four food commodities furnish nearly 75 per cent. of the total protein ingested it is obvious that a large error, or even the entire omission, of single ones of the other minor items can have but little effect.

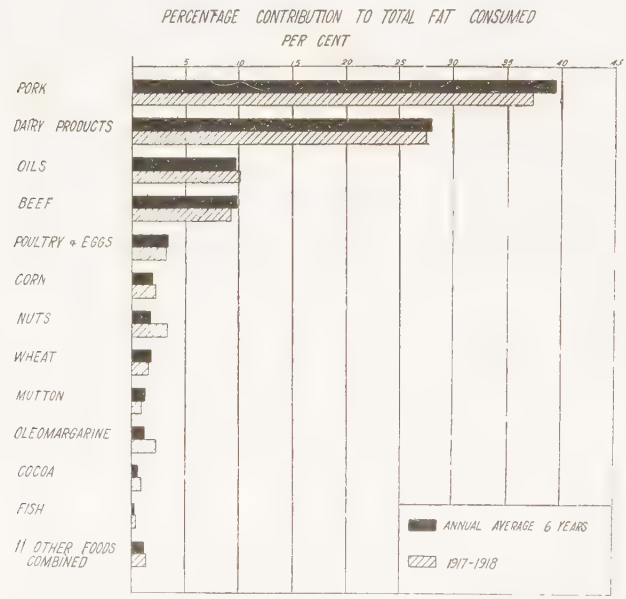

FIG. 37.—Diagram showing the percentage of the total fat consumed in the United States contributed by each of 23 commodities. The solid bars denote the average consumption in the six years preceding our entry into the war. The cross hatched bars denote the consumption in 1917 and 1918.

Comparing the order of the commodities in 1917–18 with the average of the six preceding years, it is seen that the only change of position among the eight commodities normally furnishing over 90 per cent. of the protein is in respect of the last one on the list, namely, fish. In 1917–18, the legumes (beans and peas) moved up to the eighth place and fish moved to the ninth place.

Turning to the fat consumption, it is seen that approximately 40 per cent. of the total fat in the nutritional intake of this country

comes from pork and its products. The hog is in a class by itself as a source of fat for human nutrition, with the population of this country. Dairy products stand second in the list, with approximately 27½ per cent. of the total. After the dairy products there is a considerable drop in percentage contribution in passing to the next item on the list, namely the vegetable oils, which normally furnish only about 10 per cent. of the fat intake. Beef contributes

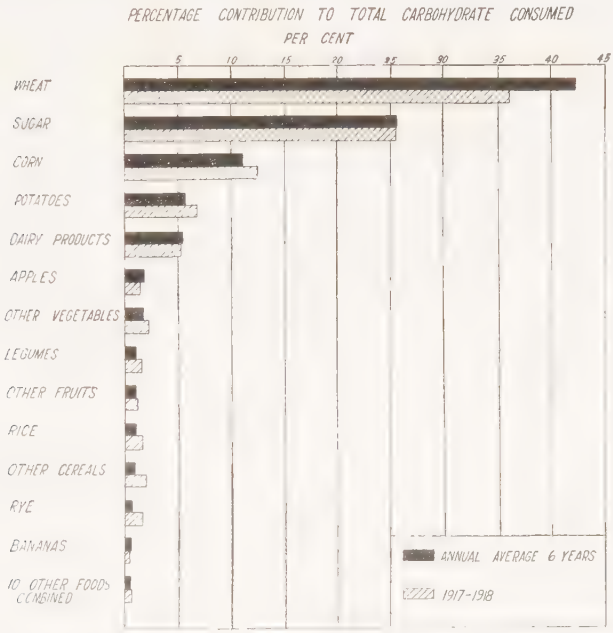

FIG. 38.—Diagram showing the percentage of the total carbohydrate consumed in the United States contributed by each of 23 commodities. The solid bars denote the average consumption in the six years preceding our entry into the war. The cross hatched bars denote the consumption in 1917 and 1918.

almost exactly the same percentage. The four commodities named together furnish nearly 87 per cent. of the total fat intake. Only one other commodity group—namely, poultry and eggs—furnishes more than 2 per cent. normally.

In 1917–18 there are some changes of significance in the relative position of the commodities as fat contributors. The first four items, pork, dairy products, oils and beef, stand in the same order in 1917–18 as in the six years preceding. Nuts moved up in 1917–18 to the

fifth place, from the seventh, which they had occupied before. Oleomargarine moved from the tenth place to the seventh. Corn, in spite of the increased consumption in 1917, dropped from the sixth place to the eighth in percentage contribution. Twelve of

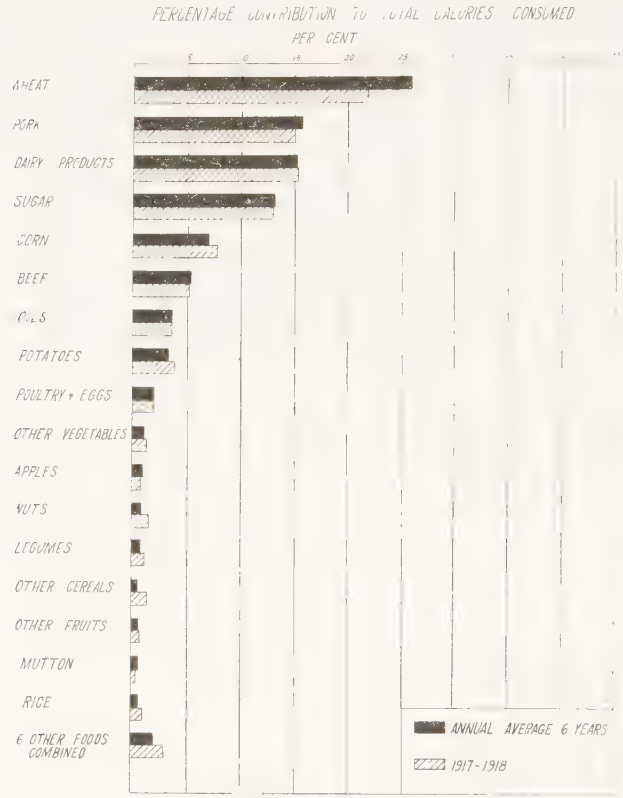

FIG. 39.—Diagram showing the percentage of the total energy value of the food consumed in the United States contributed by each of 23 commodities. The solid bars denote the average consumption in the six years preceding our entry into the war. The cross hatched bars denote the consumption in 1917 and 1918.

the great commodity groups before our entry into the war, and 13 in 1917 18, contribute less than 1 per cent. to the total fat intake.

In carbohydrate consumption wheat stands at the head of the list with over 42 per cent. normally. The sugars stand second with about 26 per cent., and corn with 11 comes next. These three commodities, together with potatoes and the dairy products, con-

tribute altogether 90 per cent. of the carbohydrate intake. There is no change in the relative position of the commodities falling in the 90 per cent. group in 1917–18 as compared with the average of the six preceding years.

A noteworthy feature of this Table 71, dealing with carbohydrates is the relative position of the sugars. Many persons regard sugar as a pleasant but not essential part of the dietary. It is obvious enough that this is a mistaken point of view. Any commodity which furnishes nearly 26 per cent. of the carbohydrate intake of the population may be regarded as an important essential. To get an idea of the importance of the sugar relatively it is only necessary to compare it with some of the items farther down in the table. For example, we see that the sugars contribute more than 20 times as much to the carbohydrate intake of the nation as does rice.

In Table 72 we get a summarized view of the general nutritional importance of the several food commodities, because here we are dealing with the energy content as measured in calories. The order of the products in this table may be taken as the general order of nutritional significance of the great staple foods in this country. Wheat stands at the head of the list, contributing nearly 26 per cent. to the total. Pork comes next with normally 16 per cent., and dairy products third with 15 per cent., and the sugars fourth with 7 per cent. Then follow corn, beef, the vegetable oils, potatoes, poultry and eggs. These 9 commodity groups together make up over 91 per cent. of the total nutritional intake of the population. The smallest contribution to the total nutrition is made by oranges furnishing about $^1/_{10}$ of 1 per cent. of the total. Bananas and fish furnish only about $^4/_{10}$ of 1 per cent. of the total, and rye and rice only a little more.

The changes in 1917–18 as compared with the average in the six preceding years, as shown in Table 72, are extremely interesting. The figures show in much more detail than any that have been available hitherto the precise effects of the conservation and substitution campaign of the United States Food Administration during 1917–18. While wheat normally contributes 25.9 per cent. of the total nutritional intake (as measured by energy value), in 1917–18 it contributed but 21.9 per cent. Or, put in another way this result means that as a result of the conservation campaign, wheat fell off $^1/_6$ in its contribution to the natural nutrition. To go farther down

the table, rice which normally contributed but 0.6 of 1 per cent. to the total nutritional intake contributed 1 per cent. in 1917–18. Rice, in other words, gained by ⅔ what it was before in its importance in feeding the American people.

The changes in consumption, as indicated in Table 72, are of such great interest that it is worth while to examine them more in detail. To this end a table on the same plan as Table 68 is shown.

TABLE 73.—SHOWING THE CHANGES IN FOOD CONSUMPTION IN THE UNITED STATES IN 1917–18 AS COMPARED WITH THE AVERAGE ANNUAL CONSUMPTION OF SIX PRECEDING YEARS FOR 23 STAPLE HUMAN FOODS

(Millions of Calories)

Commodity	Increase of consumption in 1917–18 over 6 year average	Decrease of consumption in 1917–18 under 6 year average	Percentage increase	Percentage decrease
Wheat		3,635,320		10.80
Pork	140,967		0 69	
Dairy products	1,176,387		5 93	
Sugar	742,534		4 32	
Corn	1,796,843		19 66	
Beef	224,547		3 26	
Oils	461,938		9 83	
Potatoes	1,088,668		21 93	
Poultry and eggs	27,951		1 07	
Other vegetables	439,654		30 00	
Apples		198,296		14.13
Nuts	1,066,077		89 07	
Legumes	560,784		52 02	
Other cereals	1,034,581		115.80	
Other fruits	193,390		24 15	
Mutton		237,534		30 03
Rice	606,609		78 33	
Rye	709,345		120 13	
Oleomargarine	627,874		115 69	
Fish		1,090		0 20
Bananas		89,749		17 29
Cocoa	306,872		82 54	
Oranges		45,281		32 61
Total net increase	6,888,424		5 30	
Population	5,662,979		5 73	

The data of Table 73 are exhibited graphically in Fig. 40. In this diagram the total length of the bars from the 0 line shows the total percentage increase or decrease in consumption in 1917–18 as compared with the preceding six years. The cross-hatched portion of each bar shows the percentage increase in population, and therefore the part of the increased consumption to be expected as a result of population increase. Where the black bar is below the

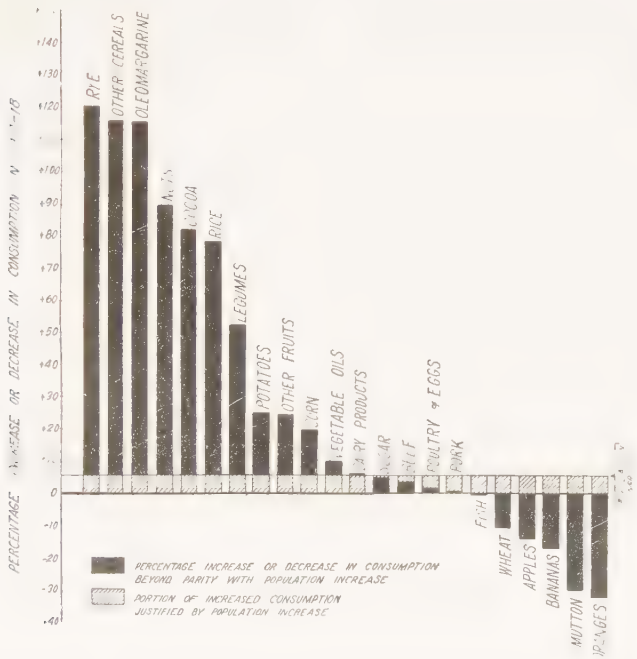

FIG. 40.—Showing the percentage increase or decrease in consumption in 1917–1918 as compared with the annual average of the six years preceding. For explanation see text.

top of the cross-hatched population bar it means a conservation. Thus the true conservation on wheat amounted to 10.80 + 5.73 = 16.53 per cent. of the normal average consumption.

The table and diagram bring out very clearly the effectiveness of the Food Administration's campaign for conservation and substitution in foods. It will be noted at once that the commodities showing great increases in consumption in 1917–18 over the preceding years are, for the most part, those which the Food Adminis-

tration urged to be substituted for articles of which the supply was less abundant, and for which the needs of the Allies were greater. Thus, rye which constituted the most popular of the substitutes for wheat in the public mind, shows the greatest increased consumption in 1917–18. Next to it stands the "Other cereals" of our classification, including barley and buckwheat. Nuts, rice and the vegetables generally show increases beyond the population increase, showing that the people very generally followed the suggestions of the Food Administration to consume more of these products and save wheat. The articles on which the Food Administration most strongly urged conservation—namely, wheat, beef, mutton, pork and the sugars—all show either a consumption actually below the normal average, or else a very slight increase in consumption, well below the population percentage increase. In either case a real and substantial conservation is, of course, shown. The decrease in consumption of the most popular fruits, oranges, apples and bananas, is largely if not entirely explained by high prices for those products.

The most interesting stage of any discussion of food—namely, the per capita per diem consumption, may be considered next. Calculating the results on this basis puts them in a form where one may form a better judgment of their meaning and compare them with accepted dietary standards. In this connection it is to be remembered that hitherto there have been no careful studies on a per capita basis of the actual nutritional intake of the population as a whole. All dietary standards are based not on the actual practice of the whole population, but rather upon dietary studies made on restricted groups of selected individuals. While a very large number of such studies have been made by the United States Department of Agriculture, particularly from ten to twenty years ago, it must be obvious that since such studies are made on selected small groups they can only inferentially give any picture of what is taking place in the population as a whole. The theory of random sampling makes it clear that any considerable inference from dietary studies, as they have been carried on, to the whole population rests on an exceedingly dubious foundation. It will therefore be of great interest to compare the results of the present careful investigation of the population as a whole with the results of previous dietary studies.

In reducing consumption data to a per capita basis it would obviously be foolish to take the actual total population as a base,

for the reason that the amount of food consumed changes with the age of the individual, particularly in early life. On account of this fact the usual practice in computations of this kind is reduced, not to a per capita basis, but to an adult man basis. In doing this a fractional factor is used to multiply the number of individuals of certain lower ages, the magnitude of the factor being proportional to the relation which the nutritional intake of the individual at the younger age bears to that of an average adult man.

In the present study the following age-intake factors have been used:

Age in years	Man value factor
0–5	0.50
6–13	0.77
14–18, male	1.00
14–18, female	0.83
19 on, male	1.00
19 on, female	0.83

The man factor values here used have been adopted after careful study of the subject. They differ in detail somewhat from those adopted by English physiologists in similar calculations, but in the net end result come to much the same thing.

Applying these factors to the total population of the United States, and assuming that the age distribution of the population is the same in each of the years studied we get the population in terms of adult men as set forth in Table 74, for the midyear point of each of the years included in this study. The population equivalents in Table 74 are used for the base for the per capita per diem calculations which follow.

TABLE 74.—POPULATION OF CONTINENTAL UNITED STATES IN TERMS OF ADULT MEN

Year	Population equivalent in adult men, January 1
1912	79,571,000
1913	80,930,000
1914	82,289,000
1915	83,648,000
1916	85,007,000
1917	86,366,000
1918	87,724,000

Before entering on the detailed discussion of per capita consumption figures it is well to recall a point which is liable to escape attention, unless special attention is called to it. This is the fact that the final figures in this chapter, which are called "consumption figures," really include something more than consumption in a nutritional sense. They include the food actually eaten plus that which is wasted by loss in cooking, in garbage, etc. It is necessary to be entirely clear on this point. In calculating the nutrients in earlier chapters, use has been made of factors which allowed for *inedible* refuse, so that all of the inedible portions of the foods as produced or imported have already been deducted in the calculations up to this point. Even after all deductions of inedible portions have been made, however, it is obvious that there is still a considerable amount of loss and wastage of strictly edible material, which might be saved and consumed under a theoretically ideal system of preparing food for the table plus a conscientious ingestion of every bit of edible material. Of course, as a matter of fact, neither of these theoretically ideal conditions at all prevail. There is a considerable loss of nutrient values in the process of cooking as ordinarily practised. This loss is undoubtedly greater for fats than for any other of the nutrients. It is a troublesome and time-consuming process for the housewife to conserve and utilize all of the fat which gets melted and floats about in the water in which foods are cooked, or adheres to the utensils in which they are prepared. Nor, in the minds of most people, is there any necessity or desirability of saving this fat. In fact, a great many people in this country object very strongly to what they designate as "greasy cooking." Consequently, floating fat of soup stock is skimmed off and thrown away in the vast majority of instances. The result is that in calculations made in the way those of this study have been made, which include the total nutrient value in the edible portion of food materials, after deducting inedible waste and deducting the losses which accrue up to the time the food reaches the consumer, there is bound to be an apparently high consumption of fats. The figures here presented are really statements of consumption plus edible waste and should be so regarded.

Another important factor is that of edible waste in garbage: That is to say, the uneaten portion of the prepared food which is edible and might be consumed, but is not for reasons of taste, overestimation of ingestive capacity, etc.

It is quite impossible to arrive at any accurate estimate of what the amount of losses of nutrients in cooking and in avoidable wastage of edible material is. On the first point it would be extremely difficult ever to gather accurate data because the practice of housewives and cooks varies so enormously in this regard. That a great deal can be accomplished in reducing the amount of edible material going into the garbage can has been demonstrated with both the civilian and the Army population of the United States during the past year.[1]

The recent study of Murlin (*loc. cit.*) gives the data regarding edible waste obtained from the nutritional surveys of the training camps. The average figures for 213 messes show that 7 per cent. of the protein supplied was wasted, 9 per cent. of the fat and 6 per cent. of the carbohydrate. Because of special conditions surrounding the investigation, however, and because of the differences of camp life, these figures are not at all applicable to civilian conditions.

Looking at the matter from the national point of view, it seems probable that of the protein in human foods left in the country for consumption in the statistical sense, it is safe to say that 5 per

TABLE 75.—SUMMARY OF CONSUMPTION PER ADULT MAN

Year	Protein		Fat		Carbohydrate		Calories	
	Per annum (kilos)	Per day (grams)	Per annum (kilos)	Per day (grams)	Per annum (kilos)	Per day (grams)	Per annum	Per day
1911–12	44.70	122	62.12	170	195.48	536	1,563,450	4,283
1912–13	44.04	121	60.44	166	198.68	544	1,558,232	4,269
1913–14	45.08	124	60.22	165	209.25	573	1,591,621	4,361
1914–15	43.05	118	63.42	174	193.42	530	1,560,326	4,275
1915–16	44.48	122	61.22	168	200.48	549	1,574,621	4,314
1916–17	43.01	118	62.45	171	189.94	520	1,536,833	4,211
1917–18	43.14	118	62.47	171	195.34	535	1,559,661	4,273
Average, whole period	43.91	120	61.78	169	197.45	541	1,565,075	4,288
Average, 1911–1912 to 1916–17	44.05	121	61.65	169	197.82	542	1,566,032	4,290

[1] Pearl, R., Statistics of Garbage Collection and Garbage Grease Recovery in American Cities, Jour. Ind. Eng. Chem., Vol. 10, No. 11, p. 927, 1918, and Murlin, J. R., Diet of the U. S. Army Soldier in the Training Camp, Jour. Amer. Med. Assoc., Vol. 71, pp. 950–951, 1918.

cent. is lost in edible wastage; of the fat left in the country for consumption as human food, it is believed that at least 25 per cent. is lost through wastage. This figure seems large, but it probably underestimates rather than overestimates the fact. Of the carbohydrates, probably there is 20 per cent. of edible wastage.

The total statistical consumption (ingestion plus edible wastage) of human food in the United States, by years from 1911 to 1918 is shown on an "adult man" per capita basis in Table 75.

Applying the estimated percentage deductions for edible wastage stated above to the per capita average for the whole period we have the following results for ingested human food:

114 grams protein	per man	per day
127 grams fat	per man	per day
433 grams carbohydrate	per man	per day
3424 calories	per man	per day

These figures are probably very close to the fact as regards protein and carbohydrate. They are probably somewhat too high still as regards fat, because the edible wastage of this component is higher than the 25 per cent. used. The intention, however, has been to use the most conservative figures in estimating waste.

For purposes of comparison Table 76 is inserted. This table is based upon certain American dietary studies analyzed in the writer's statistical laboratory.

TABLE 76.—SUMMARY OF SOME DIETARY STUDIES IN 11 GROUPS OF 116 FAMILIES

	No. of families	Average yearly income	Days per man	Per man per day: Protein, grams	Fat grams	Carbohydrates grams	Energy, calories
Mother wage earners	8	$ 640	212	105	65	472	2895
Garment makers	7	724	168	109	81	495	3145
Laborers	6	1497	305	94	102	479	3210
Retired	5	1647	130	81	121	420	3095
Clerks (office)	11	1934	225	92	120	419	3125
Mechanics	8	2133	259	97	113	460	3245
Teachers	32	2150	620	88	125	430	3195
Professional men	17	2208	438	99	148	438	3480
Engineers (professional)	5	2253	97	85	128	395	3070
Salesmen	5	2527	121	90	111	405	2980
Farmers	12	....	384	102	131	506	3610
Average	116	1771*	260	95	113	447	3185

*Average of 104 families (farmers excluded)

The general agreement of these results with those set forth in the present study, which were reached by totally different procedure, is evident. The statistical estimate of per capita protein consumption over the whole population is distinctly higher than in this small group. The fat consumption is higher but not by so large an amount as protein. The farmers and professional men show

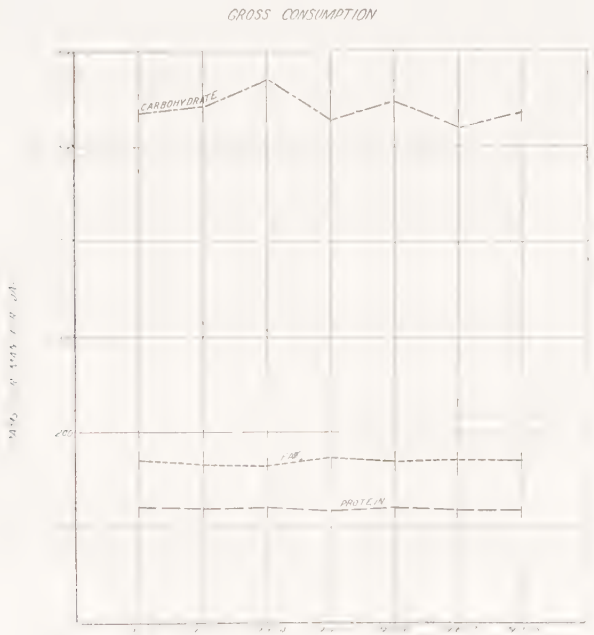

FIG. 41.—Diagram showing the course of gross consumption of protein, fat and carbohydrate in human food from 1911–12 to 1917–18, per adult man per diem. Dash line denotes protein; dot line, fat; dash-dot line, carbohydrate.

a higher net energy intake than the general average for the whole country, which would, of course, be expected. Mechanics are a little lower than the average for the country in energy intake.

In any case there is one fact which must not be lost sight of, namely that while the figures of Table 75 do in fact represent ingestion *and* waste it still is true, and the constancy of the figures in successive years proves its truth, that to maintain naturally and unconsciously a contented feeling the population in respect of

nutrition, actually uses up the amounts of nutrients indicated in Table 75. To make these gross consumption figures materially less would require a profound readjustment of the dietary and culinary habits of the people, fixed by centuries of usage. Discussion of the minimum protein, fat and carbohydrate requirements of a nation are in considerable degree academic if they base themselves upon net

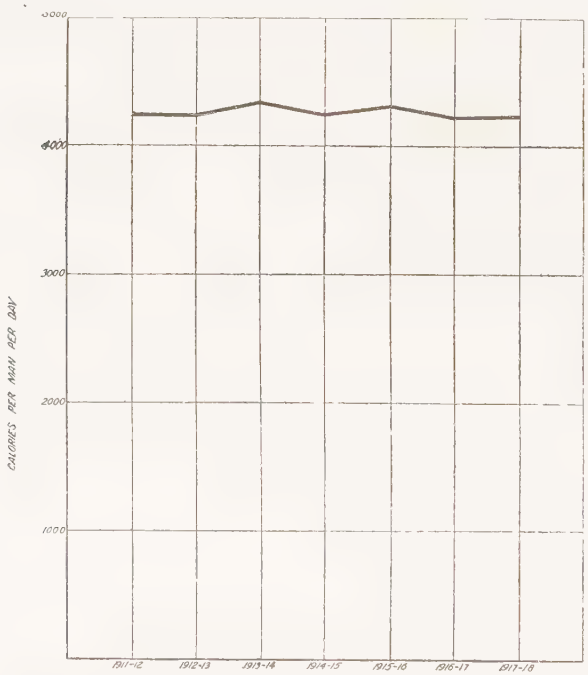

FIG. 42.—Diagram showing the energy value in calories of the gross consumption of human food, per adult man per day.

consumption rather than gross consumption. A considerable excess over any agreed upon minimum *physiological* requirements must always be allowed, because there will inevitably be, in fact, a margin between actual gross consumption and net physiological ingestion or utilization. The present study, through the figures summarized in Table 75, gives a clearer and probably more nearly exact picture of what this margin between net and gross consumption must be, in a population of the habits of the American

people, than has hitherto been available. It may well be theoretically true that a man needs only 75 grams or 50 grams of protein per day to sustain life and health, but in actual fact the American man uses up, in one way or another, about 120 grams a day. Furthermore, if the last seven years experience is any criterion, he will continue to use up about 120 grams per diem until such time as his general habits of life are in some manner rather profoundly changed. Doubtless they can be changed. But until they are, one must count on supplying about 120 grams of protein per day to each man equivalent component of the population.

The data of Table 75 are shown graphically in Figs. 41 and 42.

From these diagrams it is apparent that there has been only a very slight decrease in per capita gross food consumption since 1911. This probably does not mean that the population is eating any less, but that because of the gradually rising prices through all this period there has been a minutely slight narrowing of the margin between gross and net consumption, or, put in another way, there has been some reduction in the wastage of edible foods.

In Table 77 are shown the gross consumption figures, on a per capita per day adult man basis, for all commodities.

TABLE 77.—GROSS CONSUMPTION OF HUMAN FOODS PER ADULT MAN PER DAY

Commodity	1911–12			
	Protein in grams	Fat in grams	Carbo-hydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	34.456	3.000	226.874	1,100
Corn products	7.086	3.430	63.076	320
Rye products	0.352	0.047	4.071	19
Rice and products	0.464	0.012	4.581	21
Other cereals	0.920	0.360	5.176	28
Sub-total—Grains	43.278	6.849	303.778	1,488
Vegetables				
Legumes	2.297	0.159	6.023	36
Potatoes	3.473	0.193	28.361	132
Other vegetables	0.987	0.331	9.718	47
Sub-total—Vegetables	6.757	0.683	44.102	215
Sugars	0.016	.....	134.506	552
Fruits				
Apples	0.298	0.293	10.644	48
Oranges	0.054	0.013	1.041	5
Bananas	0.261	0.130	4.174	19
Other fruits	0.224	0.247	5.223	24
Sub-total—Fruits	0.837	0.683	21.082	96
Vegetable Oils and Nuts				
Nuts	1.393	2.670	1.050	35
Vegetable oils	.....	15.990	.....	149
Chocolate and cocoa	0.286	0.670	0.559	10
Sub-total—Oils and Nuts	1.679	19.330	1.609	194
Fish	2.994	0.660	0.001	19
Sub-total—All Primary	55.561	28.205	505.078	2,564
Meats and Meat Products				
Beef and products	18.803	17.785	0.059	244
Pork and products	13.385	67.612	0.092	684
Mutton and products	1.576	2.116	0.018	26
Sub-total—Meats	33.742	87.511	0.168	954
Poultry and eggs	8.115	5.712	.....	86
Oleomargarine	0.023	1.620	.....	15
Dairy products	25.018	47.136	30.318	666
Sub-total—All Secondary	66.898	141.979	30.486	1,721
Grand Total	122.459	170.184	535.564	4,285

TABLE 77.—*Continued*

Commodity	1912–13			
	Protein in grams	Fat in grams	Carbohydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	33.692	2.936	221.844	1,075
Corn products	6.897	3.326	61.415	311
Rye products	0.362	0.048	4.192	19
Rice and products	0.536	0.013	5.295	24
Other cereals	0.884	0.348	4.911	27
Sub-total—Grains	42.371	6.671	297.657	1,456
Vegetables				
Legumes	2.379	0.164	6.236	37
Potatoes	4.618	0.257	37.713	176
Other vegetables	1.000	0.328	9.674	47
Sub-total—Vegetables	7.997	0.749	53.623	260
Sugars	0.015	.....	138.965	570
Fruits				
Apples	0.322	0.318	11.546	52
Oranges	0.054	0.013	1.034	5
Bananas	0.244	0.122	3.910	18
Other fruits	0.277	0.247	6.243	29
Sub-total—Fruits	0.897	0.700	22.733	104
Vegetable Oils and Nuts				
Nuts	1.468	2.750	1.115	36
Vegetable oils	.....	15.509	.....	144
Chocolate and cocoa	0.270	0.632	0.528	9
Sub-total—Oils and Nuts	1.738	18.891	1.643	189
Fish	2.878	0.626	0.001	18
Sub-total—All Primary	55.896	27.637	514.622	2,597
Meats and Meat Products				
Beef and products	17.661	16.806	0.056	230
Pork and products	12.928	65.210	0.088	660
Mutton and products	1.648	2.390	0.018	29
Sub-total—Meats	32.214	84.456	0.161	919
Poultry and eggs	8.111	5.710	.....	86
Oleomargarine	0.026	1.812	.....	17
Dairy products	24.396	45.977	29.543	649
Sub total—All Secondary	64.747	137.955	29.704	1,671
Grand Total	120.643	165.592	544.326	4,268

TABLE 77—*Continued*

Commodity	1913–14			
	Protein in grams	Fat in grams	Carbohydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	38.829	3.387	255.666	1,239
Corn products	6.738	3.238	60.007	304
Rye products	0.372	0.049	4.305	20
Rice and products	0.620	0.015	6.127	28
Other cereals	0.998	0.403	5.275	29
Sub-total—Grains	47.557	7.092	331.380	1,620
Vegetables				
Legumes	2.556	0.176	6.730	40
Potatoes	3.624	0.201	29.596	138
Other vegetables	0.952	0.306	9.529	46
Sub-total—Vegetables	7.132	0.683	45.855	224
Sugars	0.015	.....	147.266	604
Fruits				
Apples	0.193	0.190	6.899	31
Oranges	0.051	0.013	0.977	4
Bananas	0.274	0.137	4.380	20
Other fruits	0.222	0.253	4.996	24
Sub-total—Fruits	0.740	0.593	17.252	79
Vegetable Oils and Nuts				
Nuts	1.673	3.166	1.278	42
Vegetable oils		18.028		168
Chocolate and cocoa	0.340	0.795	0.664	11
Sub-total—Oils and Nuts	2.013	21.989	1.942	221
Fish	2.867	0.618	0.001	18
Sub-total—All Primary	60.324	30.975	543.696	2,766
Meats and Meat Products				
Beef and products	16.905	16.212	0.053	221
Pork and products	12.136	61.765	0.083	625
Mutton and products	1.621	2.577	0.018	31
Sub-total—Meats	30.613	80.554	0.153	876
Poultry and eggs	8.156	5.743	.....	87
Oleomargarine	0.026	1.773	.....	17
Dairy products	24.358	45.942	29.437	648
Sub-total—All Secondary	63.183	134.012	29.590	1,628
Grand Total	123.507	164.987	573.286	4,394

TABLE 77—*Continued*

Commodity	1914–15			
	Protein in grams	Fat in grams	Carbo-hydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	32 059	2.794	211.133	1,023
Corn products	6.600	3.163	58.793	298
Rye products	0.368	0.049	4.256	19
Rice and products	0.440	0.011	4.343	20
Other cereals	0.936	0.380	4.908	28
Sub-total—Grains	40.403	6.397	283.433	1,388
Vegetables				
Legumes	2.254	0.159	5.877	35
Potatoes	4.335	0 241	35.399	165
Other vegetables	1 095	0 332	9.984	49
Sub-total—Vegetables	7.684	0.732	51.260	249
Sugars	0 015		141 484	589
Fruits				
Apples	0.336	0 332	12.039	54
Oranges	0.049	0.012	0.945	4
Bananas	0.226	0.113	3.613	17
Other fruits	0.258	0 216	5.560	26
Sub-total—Fruits	0.869	0.673	22.157	101
Vegetable Oils and Nuts				
Nuts	1.668	3.115	1.258	41
Vegetable oils		19 489		181
Chocolate and cocoa	0.301	0.707	0 588	10
Sub-total—Oils and Nuts	1 969	23.311	1 846	232
Fish	2 843	0 614	0 001	18
Sub-total—All Primary	53.783	31.727	500.181	2,568
Meats and Meat Products				
Beef and products	16 662	16 061	0.054	219
Pork and products	13 655	70 678	0 094	714
Mutton and products	1 384	2 105	0 015	25
Sub-total—Meats	31 677	88.676	0 163	956
Poultry and eggs	8 156	5 743		87
Oleomargarine	0 025	1.733		16
Dairy products	24 307	45 870	29 586	648
Sub-total—All Secondary	64 165	142 022	29.749	1,707
Grand Total	117 948	173 749	529 930	4,275

TABLE 77—*Continued*

Commodity	1915-16			
	Protein in grams	Fat in grams	Carbohydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	37.363	3.260	246.108	1,193
Corn products	6.483	3.100	57.767	292
Rye products	0.370	0.049	4.282	20
Rice and products	0.537	0.013	5.308	24
Other cereals	1.036	0.428	5.219	30
Sub-total—Grains	45.789	6.850	318.684	1,559
Vegetables				
Legumes	1.921	0.134	4.955	29
Potatoes	3.720	0.207	30.380	142
Other vegetables	1.041	0.354	11.172	54
Sub-total—Vegetables	6.682	0.695	46.507	225
Sugars	0.015	.....	130.441	535
Fruits				
Apples	0.310	0.308	11.130	50
Oranges	0.049	0.012	0.944	4
Bananas	0.199	0.099	3.182	15
Other fruits	0.300	0.296	6.640	31
Sub-total—Fruits	0.858	0.715	21.896	100
Vegetable Oils and Nuts				
Nuts	1.546	3.207	1.177	41
Vegetable oils		13.693		127
Chocolate and cocoa	0.383	0.899	0.748	13
Sub-total—Oils and Nuts	1.929	17.799	1.925	181
Fish	2.577	0.517	0.001	16
Sub-total—All Primary	57.850	26.576	519.454	2,616
Meats and Meat Products				
Beef and products	16.925	16.181	0.056	221
Pork and products	13.058	69.083	0.004	697
Mutton and products	1.298	2.019	0.014	21
Sub-total—Meats	31.233	87.033	0.164	939
Poultry and eggs	8.132	5.727	.....	87
Oleomargarine	0.026	1.785	.....	17
Dairy products	24.635	46.593	29.639	656
Sub-total—All Secondary	64.026	141.138	29.803	1,699
Grand Total	121.876	167.714	549.257	4,315

TABLE 77—*Continued*

Commodity	1916–17			
	Protein in grams	Fat in grams	Carbohydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	32.578	2.839	214.602	1,040
Corn products	6.399	3.054	57.021	288
Rye products	0.388	0.051	4.496	21
Rice and products	0.804	0.020	7.935	36
Other cereals	1.247	0.526	5.997	35
Sub-total—Grains	41.416	6.490	290.051	1,420
Vegetables				
Legumes	2.405	0.165	6.286	37
Potatoes	2.972	0.165	24.275	113
Other vegetables	0.897	0.318	10.073	48
Sub-total—Vegetables	6.274	0.648	40.634	198
Sugars	0.014	.....	138.211	567
Fruits				
Apples	0.269	0.268	9.682	43
Oranges	0.069	0.017	1.330	6
Bananas	0.183	0.092	2.933	14
Other fruits	0.229	0.267	5.314	25
Sub-total—Fruits	0.750	0.644	19.259	88
Vegetable Oils and Nuts				
Nuts	1.521	3.351	1.165	42
Vegetable oils	.....	17.361	.....	162
Chocolate and cocoa	0.589	1.381	1.149	20
Sub-total—Oils and Nuts	2.110	22.093	2.314	224
Fish	2.673	0.558	0.001	17
Sub-total—All Primary	53.237	30.433	490.470	2,514
Meats and Meat Products				
Beef and products	17.852	17.071	0.060	233
Pork and products	12.650	66.583	0.092	672
Mutton and products	1.161	1.796	0.013	22
Sub-total—Meats	31.612	85.205	0.163	924
Poultry and eggs	8.105	5.710	.....	86
Oleomargarine	0.039	2.717	.....	25
Dairy products	24.850	47.023	29.751	662
Sub-total—All Secondary	64.606	140.655	29.914	1,697
Grand Total	117.843	171.088	520.384	4,211

TABLE 77—*Continued*

Commodity	1917-18			
	Protein in grams	Fat in grams	Carbohydrate in grams	Calories
Grains and Derivative Products				
Wheat and products	29.374	2.556	193.483	938
Corn products	7.570	3.712	67.313	342
Rye products	0.768	0.102	8.891	41
Rice and products	0.960	0.024	9.476	43
Other cereals	2.033	0.722	11.020	60
Sub-total—Grains	40.705	7.116	290.183	1,424
Vegetables				
Legumes	3.297	0.229	8.657	51
Potatoes	4.471	0.248	36.516	170
Other vegetables	1.145	0.393	12.439	59
Sub-total—Vegetables	8.913	0.870	57.612	280
Sugars	0.014	.....	136.611	560
Fruits				
Apples	0.233	0.233	8.383	38
Oranges	0.035	0.009	0.667	3
Bananas	0.180	0.090	2.884	13
Other fruits	0.290	0.211	6.847	31
Sub-total—Fruits	0.738	0.543	18.781	85
Vegetable Oils and Nuts				
Nuts	2.559	5.601	1.969	71
Vegetable oils		17.329		161
Chocolate and cocoa	0.627	1.476	1.224	21
Sub-total—Oils and Nuts	3.186	24.406	3.193	253
Fish	2.655	0.558	0.001	17
Sub-total—All Primary	56.211	33.493	506.381	2,619
Meats and Meat Products				
Beef and products	16.856	16.040	0.049	219
Pork and products	11.830	63.888	0.089	643
Mutton and products	0.884	1.463	0.010	17
Sub-total—Meats	29.522	81.269	0.147	878
Poultry and eggs	7.769	5.472	.....	83
Oleomargarine	0.056	3.905		37
Dairy products	24.640	47.007	28.644	656
Sub-total—All Secondary	61.987	137.653	28.791	1,654
Grand Total	118.198	171.146	535.172	4,273

In bringing this book to a conclusion, the writer would emphasize that he has been solely concerned in the presentation of an accurate picture of the *facts* regarding an obviously important matter, national nutrition. He has no theories to propound about these facts, and discussions about the relations of national nutrition to various social, political, medical, economic, or industrial problems are conspicuously absent from the book. This is deliberate. It does not indicate that the writer fails to perceive these problems, and their relation to national nutrition. It means rather that he has thought it wiser to separate sharply the facts as such from their possible application. The book constitutes a definite piece of statistical research, precisely delimited as to scope. It makes available for the first time a knowledge, to at least the first degree of approximation, of how much and what kinds of food the American people as a great whole eat.

APPENDIX

THE CONSUMPTION OF NUTRIENTS BY DOMESTIC ANIMALS IN THE FORM OF FEEDS AND FODDERS

It was the original intention in this study to follow the statistical analysis of human food consumption with an equally detailed and searching analysis of the consumption of nutrients by the domestic animals. Indeed, the preliminary statistical work had been completed. But the signing of the armistice and the consequently necessary diversion of the writer's energies and interests into totally different channels have made the carrying out of the original plan impossible. It does, however, appear desirable that all of the work done on the animal feeds and fodders should not be lost. Consequently, I am inserting here as an appendix the final table of *consumption* of animal feeds in the several years. The figures in this table were reached by precisely the same statistical plan as has been followed in the case of human foods in the body of the book. Exports and imports were balanced to get net exports. These net exports were deducted from net production (after taking out losses, etc.) to find net consumption. In the final table here reproduced many single products, which in the intermediate calculations were kept separate, are grouped in large general classes, such as "Wheat and products." This rubric includes all the wheat milling by-products, wheat fed as such, etc.

Beyond the figures given in this table should come the nutrients derived by grazing animals from green pasturage harvested by the animals themselves. In certain of the European countries attempts have been made to estimate this exceedingly difficult quantity. Under the conditions of animal husbandry prevailing in the United States, and having due regard to the enormous size of the country and the consequent diversity of conditions, it seems to the writer hopelessly impossible to arrive at a significant national estimate of the amount of nutriment got by animals from pasturage. One can, of course, guess at a figure, but there is no means of evaluating the probable error of the guess. Consequently, the figures given in the following table are to be interpreted as minimum amounts of nutrients consumed by domestic animals, which can be definitely accounted for statistically. To them should be added the unknown X of pasturage.

SHOWING THE CONSUMPTION OF ANIMAL FEEDS AND FODDERS

Commodity	1911–1912			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	5,750,803	2,723,188	38,159,237	205,392,129
Wheat and products	519,415	172,818	2,136,889	12,500,360
Oats and products	1,392,482	492,120	6,706,189	37,787,510
Barley and products	277,771	57,825	1,253,291	6,816,172
Rye and products	66,356	11,942	320,247	1,696,406
Buckwheat and products	27,819	6,641	131,183	713,751
Rice and products	6,912	1,287	28,424	156,856
Kaffir corn	83,741	22,633	528,848	2,722,540
Sub-total—Grains	8,105,474	3,483,292	49,233,636	267,530,636
Oil cake and meal	561,319	134,231	494,417	5,578,735
Molasses	.....	.....	166,071	680,985
Peanuts	3,906	6,685	2,899	90,112
Hay	5,164,437	1,537,036	26,498,477	144,135,859
Sub-total—All Primary	13,835,136	5,161,244	76,395,500	418,016,327
Dairy products	610,523	40,166	722,987	5,844,321
Grand Total	14,445,659	5,201,410	77,118,487	423,860,648

Commodity	1912–1913			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	7,227,040	3,438,178	48,148,008	259,057,323
Wheat and products	561,015	186,139	2,316,813	13,532,664
Oats and products	2,175,772	769,818	10,472,663	59,027,643
Barley and products	387,088	78,150	1,895,243	10,085,870
Rye and products	65,415	11,876	310,297	1,651,122
Buckwheat and products	31,522	7,488	154,390	831,952
Rice and products	7,536	1,359	32,571	177,121
Kaffir corn	111,654	30,177	705,130	3,630,053
Sub-total—Grains	10,545,728	4,517,636	64,002,139	347,719,494
Oil cake and meal	541,635	129,054	477,903	5,382,199
Molasses	.....	.....	164,017	672,566
Peanuts	4,282	7,327	3,178	98,773
Hay	6,921,035	2,059,832	35,511,502	193,161,318
Sub-total—All Primary	18,012,680	6,713,849	100,158,739	547,034,350
Dairy products	604,565	39,774	715,931	5,787,287
Grand Total	18,617,245	6,753,623	100,874,670	552,821,637

Commodity	1913–1914			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	5,668,037	2,682,773	37,592,297	202,351,941
Wheat and products	607,984	200,761	2,495,609	14,594,493
Oats and products	1,762,488	622,995	8,487,380	47,826,293
Barley and products	305,186	63,257	1,394,568	7,558,447
Rye and products	80,744	14,084	405,923	2,126,645
Buckwheat and products	21,270	5,099	97,221	533,288
Rice and products	7,644	1,377	33,086	179,851
Kaffir corn	139,568	37,721	881,413	4,537,566
Sub-total—Grains	8,576,823	3,623,876	51,362,590	279,501,383
Oil cake and meal	617,218	147,782	543,300	6,134,303
Molasses	.....	.....	200,539	822,327
Peanuts	4,656	7,968	3,456	107,406
Hay	6,042,586	1,798,389	31,004,223	168,644,423
Sub-total—All Primary	15,241,283	5,578,015	83,114,108	455,209,842
Dairy products	611,643	40,239	724,314	5,855,050
Grand Total	15,852,926	5,618,254	83,838,422	461,064,892

Commodity	1914–1915			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	6,179,888	2,927,469	41,079,900	221,028,602
Wheat and products	562,816	183,232	2,328,559	13,561,180
Oats and products	1,572,114	555,180	7,574,133	42,669,860
Barley and products	302,093	61,915	1,423,313	7,651,115
Rye and products	54,906	9,313	261,851	1,385,527
Buckwheat and products	26,732	6,349	130,563	704,059
Rice and products	6,683	1,404	21,773	129,613
Kaffir corn	167,481	45,265	1,057,696	5,445,079
Sub-total—Grains	8,870,669	3,789,595	53,874,626	292,548,738
Oil cake and meal	680,219	161,939	600,889	6,760,704
Molasses	.....	.....	135,546	555,816
Peanuts	5,011	8,575	3,719	115,590
Hay	6,749,653	2,008,825	34,632,148	188,378,160
Sub-total—All Primary	16,305,552	5,968,934	89,246,928	488,359,008
Dairy products	627,128	41,258	742,652	6,003,283
Grand Total	16,932,680	6,010,192	89,989,580	494,362,291

Commodity	1915–1916			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	6,714,748	3,200,688	45,033,322	241,975,130
Wheat and products	806,150	265,143	3,302,518	19,314,915
Oats and products	2,266,087	801,155	10,911,496	61,489,015
Barley and products	381,716	76,111	1,927,738	10,178,118
Rye and products	79,696	13,300	408,617	2,126,106
Buckwheat and products	23,107	5,497	111,569	603,375
Rice and products	5,494	1,178	17,013	103,124
Kaffir corn	303,524	82,034	1,916,851	9,868,060
Sub-total—Grains	10,580,082	4,444,992	63,628,444	345,652,185
Oil cake and meal	514,981	121,413	457,127	5,116,469
Molasses	.....	.....	140,706	576,974
Peanuts	4,624	7,913	3,432	106,663
Hay	8,160,957	2,428,856	41,873,485	227,766,702
Sub-total—All Primary	19,260,644	7,003,174	106,103,194	579,218,993
Dairy products	652,081	42,900	772,201	6,242,150
Grand Total	19,912,725	7,046,074	106,875,395	585,461,143

Commodity	1916–1917			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	5,855,023	2,759,071	38,554,303	207,773,325
Wheat and products	437,287	143,308	1,804,983	10,527,982
Oats and products	1,750,287	617,062	8,439,477	47,524,602
Barley and products	284,856	59,461	1,277,398	6,959,281
Rye and products	64,951	10,846	319,325	1,676,654
Buckwheat and products	16,974	4,066	78,129	427,780
Rice and products	4,673	1,043	13,022	82,122
Kaffir corn	142,819	38,600	901,944	4,643,259
Sub-total—Grains	8,556,465	3,633,352	51,387,954	279,609,790
Oil cake and meal	553,544	129,999	492,401	5,499,100
Molasses	.....	.....	150,075	615,392
Peanuts	4,570	7,821	3,392	105,430
Hay	8,454,185	2,516,126	43,378,018	235,950,464
Sub-total—All Primary	17,568,764	6,287,298	95,411,840	521,780,176
Dairy products	675,265	44,425	799,655	6,464,075
Grand Total	18,244,029	6,331,723	96,211,495	528,244,251

Commodity	1917–1918			
	Protein (metric tons)	Fat (metric tons)	Carbohydrates (metric tons)	Calories (millions)
Corn and products	6,770,333	3,245,104	46,055,653	246,808,493
Wheat and products	521,224	177,320	2,073,796	12,291,942
Oats and products	2,274,067	800,870	10,970,728	61,762,002
Barley and products	334,422	64,236	1,785,921	9,292,200
Rye and products	85,582	13,643	371,429	2,000,937
Buckwheat and products	28,831	6,810	146,414	781,940
Rice and products	2,868	535	11,745	64,881
Kaffir corn	201,180	54,373	1,270,517	6,540,695
Sub-total—Grains	10,218,325	4,362,844	62,685,922	339,540,751
Oil cake and meal	715,317	166,313	636,403	7,090,224
Molasses	.....	.....	160,425	657,834
Peanuts	7,609	13,021	5,648	175,524
Hay	7,265,588	2,162,377	37,279,384	202,777,540
Sub-total—All Primary	18,206,839	6,704,555	100,767,782	550,241,873
Dairy products	686,768	45,182	813,277	6,574,191
Grand Total	18,893,607	6,749,737	101,581,059	556,816,064

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